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Information Memorandum No. DSC-82-93, change 1
Expires 9/30/82

To: All SDS; BLM D-BIFC; and OCS Managers

From: Service Center Director

Subject: Final Results of Remote Sensing Training Questionnaire, Instruction Memorandum No. DSC-82-88

Attached is a summary report with final results of the remote sensing training questionnaire. Please note that the first section contains not only a summary of responses for each question, but also a comment by the Division of Scientific Systems (D-440) concerning implementation of suggested changes. Please direct any inquiries to Bill Yeager, Branch of Scientific Systems Applications (D-442) at FTS 234-6730.

Richard E. Enger
ASCD, Technical and Scientific Systems
Acting

1 Enclosure
Encl. 1 - Remote Sensing Training Questionnaire

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REMOTE SENSING
TRAINING QUESTIONNAIRE

FINAL RESULTS

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DIVISION OF SCIENTIFIC SYSTEMS

D-440

AUGUST 1982

PART A - EVALUATION OF CURRENT COURSES

Question #1

At the present time the Branch of Remote Sensing (BRS) and the Division of Scientific Systems Development (SSD) offer the following courses on a regular basis:

1. 9180-8, Introduction to Remote Sensing Applications, 5 day course, with established training sites at Monument, CO; Reno, NV; and Tucson, AZ. In general, most course attendees come from the general geographical area surrounding the training site. Course covers fundamentals of remote sensing; vegetation, drainage, and landform mapping exercises; orthophotos; introduction to LANDSAT; and BLM applications of Remote Sensing.
2. 9180-10, Remote Sensing for Geologists and Mining Engineers. This course has been offered in two parts, Part I covering visual analysis of aerial photography and LANDSAT imagery, with Part II covering computer-assisted techniques. Each course takes 5 days. This course is usually offered at the EROS Data Center in Sioux Falls, South Dakota.
3. 9180-13, Introduction to Digital Image Analysis Techniques, 5 day course taught at Denver Service Center. This course includes project design, vegetation classification procedures using Landsat Imagery, change detection, geographic information systems, and a display of products (such as vegetation type maps or range suitablility overlays) from BRS projects.

(for managers) Assuming the above courses continue to be offered in the same geographical locations during the months shown, how many students from your District or State Office would you send to each course per year? Please indicate the District or State Office Division that your answers cover, so duplicate answers can be avoided.

Summary:

9180-8, Monument, Colorado Fall	18-27
9180-8, Reno, Nevada, Fall	24-35
9180-8, Tucson, Arizona, Spring	11-13
9180-10, Sioux Falls, South Dakota, Part I: Variable Part II: Variable	23-28
9180-13, Denver, Colorado, January-February	33-47

Comment:

Responses indicated that a sufficient number of students would be able to attend all courses except possibly Tucson. The low figures seem to reflect the ever decreasing availability of training-related travel funds throughout the Bureau and the anticipated cuts for FY 83.

Partially in view of these results, the 9180-8 course has been scheduled for Reno (Oct. 18-22, 1982) and Monument (Nov. 15-19, 1982) only. The 9180-13 digital course has been scheduled (and will appear in the FY 83 training catalog as well) for Feb. 7-11, 1983, in Denver.

The Tucson 9180-8 course will not be held in FY 83 unless at least 15-20 employees can attend. During the past several years, it has proved impossible to reach this required minimum for the Arizona course.

The 9180-10 course for geologists and mining engineers is not currently scheduled for FY 83, pending results of an analysis by DSC and WO. Persons wishing more information should contact Jean Juilland at FTS 234-4620 (comm. 303-234-6730). Depending on the findings in the DSC analysis, alternatives will be presented to WO and based on their decision, the course may be offered in FY 84.

Question #2: (for managers) How many of your employees are in need of remote sensing training but probably could not attend the above courses because of certain restrictions? Please specify the nature of these restrictions (e.g., limited funds for training-related travel, workload conflicts, etc.)

Summary:

		Restrictions
9180-8	279-386	Travel/budget
9180-10	54-63	Travel/budget
9180-13	79-110	Travel/budget

Comment:

As expected, the number of employees needing remote sensing training but unable to obtain it is significant. Past questionnaires have also borne out this point. Clearly, past budgets have not allowed Districts and State Offices to get all their personnel trained, and the situation is not likely to improve.

The present courses serve to meet part of Bureau remote sensing training needs, but new approaches must be considered. Fortunately, the excellent response to the questionnaire has given us some guidance, which will be evident in responses to questions 4 through 7.

Question #3: The 9180-8 course (Introduction to Remote Sensing Applications) includes a 1-day field trip, which is an integral part of the course. Because of field site accessibility problems, generally a winter date is not feasible. Scheduling during the other months is flexible and hopefully can be done to avoid conflicts with the field season. (9180-13 does not incorporate a field trip).

(for all) What specifically would you change as far as course content or course length? Is the time of year when the courses are offered convenient?

9180-8 - INTRODUCTION TO REMOTE SENSING APPLICATIONS

Summary:

The majority of respondents indicated that the course length, content, location, and time of year were convenient. A frequent response was the need to keep the training practical and BLM work-oriented.

Suggestions for additional course topics were frequent, including rights-of-way work, soil survey, monitoring, etc. Some preferred a winter-training date.

Some respondents indicated that the course is really too basic for most Bureau personnel and is too long. Some mentioned that they did not know enough about the course to give an opinion.

Comment:

The range of responses indicates the difficulty we as trainers have in addressing the needs of a group with diversified experience. On the one hand, we have some new employees with limited field experience and, increasingly, with little or no college remote sensing education. On the other hand, we have employees with considerable experience who have finally been approved for this course after requesting it unsuccessfully for several years and for whom the course is too basic.

We must also strike a balance between explaining what state-of-the-art techniques may exist and recognizing what a typical field office is apt to have.

We see no mandate for restructuring the present course as a result of this questionnaire. We intend to follow-up on the suggestions dealing particularly with remote sensing in soil survey and monitoring, and possibly schedule more field time.

In addition to the present questionnaire, we have received useful comments in evaluations made by students at the conclusion of past 9180-8 sessions, which have had a considerable impact on course content.

Some suggested holding the course during the winter months, but field accessibility would be difficult to impossible for the Reno and Monument sites. The Tucson site *may* be accessible at this time, but, as noted, projected attendance is very low. Furthermore, comparison of growing season photography with winter field conditions might prove confusing to students.

9180-10 - REMOTE SENSING FOR GEOLOGISTS AND MINING ENGINEERS

Few respondents seemed to know much about this course. Many mentioned that they were unable to provide any suggestions, especially since no course agenda was enclosed.

Of those who did comment, most viewed the course content, length, and time of year as appropriate. Some mentioned that BLM applications should be stressed to better reflect the work the BLM geologist commonly performs, such as mining law and lease applications. A few respondents saw little need for this training.

Comment:

The information about the course which was sent to the people in the field was not sufficient for most of them to comment and/or make recommendations.

There is an understandable lack of awareness as to how methods using remotely sensed data could help the BLM mineral specialists.

The number of those indicating interest (or need) in such a course is large enough (23-28) to warrant at least one session.

9180-13 - INTRODUCTION TO DIGITAL IMAGE PROCESSING TECHNIQUES

Summary:

The vast majority of respondents indicated that the present course content, length, location, and date were convenient and appropriate.

Some respondents indicated they would change nothing in the course. Several remarked that the course is appropriate only to those who are working or are scheduled to work on a project. Some took a differnt approach and suggested that the course be more application-oriented and concentrate less on technical aspects.

A small number of respondents indicated they were not familiar enough with the course to form any judgment.

Comment:

In view of the above responses and evaluations from past attendees, no major modifications in the course are anticipated.

We at the Division agree that the primary target audience consists of resource specialists and other field personnel who will be actively involved in District or State projects, in conjunction with DSC, even if these projects are only tentative. As more technical work can be done at the local level (digitizing on ADS, for example), attendance at this type of course becomes even more important.

Minor changes in lecture format and classroom exercises will be made where appropriate.

PART B - POSSIBLE/PROPOSED COURSES

Question #4: Introductory course similar to 9180-8 (Introduction to Remote Sensing Applications) course but conducted at a District or State Office.

(for managers) Would your District or State support this type of basic course if held in your area? How many students would attend this course? What degree of involvement - if any - do you envision for DSC in this new course?

Summary:

This question was answered with an overwhelmingly positive response. Many State and District Offices have indicated that they encourage and will support such training.

The local course is seen largely as a Denver Service Center/State Office/District Office combined program. Except for those states with ongoing introductory courses (Montana, Alaska, Wyoming, Idaho, and others?), DSC involvement ranges from minimal to complete.

Some respondents saw the DSC role diminishing in the future as the SO's and DO's assumed more of the organizational and instructional duties, though several mentioned the need for DSC to ensure state-of-the-art and recent developments would be discussed.

Proposed attendance figures varied widely, but a range of 15-25 resource specialists was common.

Comment:

Support for the introductory remote sensing course to be offered at a State or District Office was very evident. As noted, DSC has responded to such requests in the past (Montrose District, May 1981; Redding District, October 1980). Such courses have been highly successful.

As presently staffed and funded, the Division would be able to conduct such local sessions perhaps twice a year. Preparation of the course--including selection of a field site; selection and acquisition of aerial photography and orthophotos; preparation of the necessary vegetation, soils, or other exercises--can easily required 2-3 workmonths. Tailoring of the course to meet specific District objectives requires an investment of time. At least one pre-course trip to the site is necessary for outside instructors.

The Division cannot possibly hope to reach but a fraction of the 279-386 employees identified as in need of this training.

The solution is not readily apparent. An increase in the DSC staff to meet this training need would ease the problem, but is highly unlikely in this time of tight budgets. State and District Office presonnel are being asked to complete a number of additional duties with fewer workmonths, so being able to devote several workmonths to course preparation may prove impossible. A combined DSC-SO-DO effort would probably be a necessity, with the exact mix depending on each project.

Another alternative may be the establishment of new regional sites, such as in Wyoming, Idaho, Oregon, or other areas. Courses would then be offered at these regional sites--as well as Reno, Monument, and Tucson--every 3 to 5 years on a rotating basis.

(for all) How long should the course be? What different disciplines would be represented? What topics should be covered? Any other suggestions?

Summary:

Most respondents indicated that resource specialists would comprise the majority of the potential audience. These included, among others, range, forestry, soils, wildlife, archaeology and realty personnel.

Many respondents indicated a desire to restrict materials to those presently on hand, while others desired some introduction to Landsat and digital image processing. Most respondents saw the course centering around use of aerial photos, their use in resource mapping and monitoring, and techniques for transferring photo-interpreted data to base maps.

Suggestions on course length tended to vary, with 2 to 3 days being the most frequent response.

Comment:

Since the audience at the typical District Office would possibly consist of resource specialists from different diciplines, the course would have to be balanced to address some common ground. Though it may be possible to have small groups divided by resource specialty, in-depth analysis on a single resource would probably not be advisable.

A course length of 2 to 3 days would be fine, with one day devoted to field work.

With limited Division capabilities in some fields, such as archaeology, local assistance would be vital to the success of the course.

(for all) Please explain why you think this new course should be added -- what advantages would be gained?

Summary:

The most commonly cited advantages were:

1. The course would be locally relevant, use local photography, and could be tailored specifically to District needs.

2. Few or no travel costs would be incurred by the District.

3. More personnel would be able to attend.

Comment:

None. The advantages are pretty clear.

Question #5: Intermediate-level, discipline-specific course.

This course could be conducted for a single purpose (such as to train a summer field crew) or for multiple purposes within a discipline (such as inventory, sale layout, and trespass applications within forestry). It could be held either at a central location or at a State or District Office, depending on projected attendance. It could be scheduled as part of a workshop (e.g., range workshop), or immediately before or after such a function, in order to take advantage of the group already being assembled.

(for managers) Would your District or State support this type of course? How many students would be sent (by specialty)? Would you have enough students to hold the course locally? What degree of involvement - if any - do you envision for DSC?

Summary:

Responses tended to vary considerably on this question. The majority of respondents seemed to favor the idea of an intermediate level, discipline-specific course, though some indicated they did not support it. Most expressed doubt that a large enough group of specialists would be present in a district or districts, with the possible exception of range conservationists. Typical responses indicated 2-4 specialists would be able to attend from each district. Some respondents indicated that offering the course in conjunction with a workshop was a good idea which they would support.

Alternative suggestions were to hold the course at a central location in the state where it would be accessible to several or all districts.

Several respondents saw this type of course as being heavily dependent on DSC at first, with State/District Offices assuming the major role in the future.

OCS respondents mentioned that upland-oriented courses are not appropriate for their particular work, but that a specially designed course covering such topics as oceanography or coastal morphology would be very useful.

Other suggestions included combining this course with the introductory course or incorporating it into the land, range, and minerals courses at the Phoenix Training Center. A final comment was that budget considerations may force several related disciplines to be considered together.

(for all) How long should the course be? Specifically what topics should be covered? Any other suggestions?

Summary:

The vast majority seemed to regard 2-3 days as adequate for the course, though estimates ranged from 1/2 day to 5 days. A number of topics were suggested, covering the wide variety of disciplines in the Bureau. The most frequent responses, however, dealt with vegetation inventory and monitoring techniques. Many indicated a desire to learn about more advanced techniques of remote sensing. Several stressed the need to make this course very practical--to discuss day-to-day problems.

Comment:

The wide range of responses makes it difficult to come up with a consensus, and, indeed, no clear mandate is given.

Several comments, however, can be made:

1. An intermediate-level, discipline-specific course would undoubtedly have to have conducted at a central location within a State (or several States) in order to secure a minimum number of attendees. This will involve travel expenses for some. Tight travel funds have been the major reason employees have not been able to attend remote sensing training courses at Reno, Monument, Tucson, and Denver; and it would be expected that the same problems would occur for potential participants at a discipline-specific course.

2. A possible problem exists as far as course content. Some expressed the concern that the course be practical in the sense that it cover current field procedures or problems. Others seemed to view the course as a means of keeping up with new techniques, although these may not be in use in the Bureau. The questionnaire results are not conclusive in this respect. Perhaps both aspects could be incorporated.

3. The best suggestion seems to be conducting the course in conjunction with a scheduled workshop. Under such an arrangement, co-workers would serve as instructors and relate their experiences. Participation by the Division of Scientific Systems would probably be limited to logistics, since Division personnel possibly would not be well enough acquainted with resource-specific techniques to serve as instructors. In order to conduct such a course, then, a commitment of workmonths would have to be made by field people and possibly by resource people from DSC-Division of Resource Systems or from out of State. The workshop would be an effective way to spread the word--inform others how things are being done--but might be considered a poor investment of time by the more experienced users.

4. The suggestion to incorporate this type of course into the Phoenix Training Center courses has already been done to some extent. Wally Crisco, the aerial photo coordinator for DSC, has been conducting airphoto interpretation courses in Phoenix for a number of years. Division personnel have given presentations at the Phoenix school on the use of remote sensing for Bureau geologic and minerals applications. Perhaps more resource-specific topics in remote sensing can be addressed.

Concerning the OCS - A special course was offered in Corpus Cristi, Texas, in February of 1980 for OCS personnel. With the recent shift of OCS to the Minerals Management Service, however, it is uncertain what role - if any - the Bureau would have in future courses.

Question #6:	Possible/Proposed Course: For Managers. Managers are seldom able to devote an entire week to remote sensing training, and in many cases they would have difficulty attending even a 2-3 day session. Possibly a half-day to full day session would be feasible.
	This course could be offered in conjunction with other functions, such as a meeting of District Managers.
(for managers)	Would your office support such a course? What specific topics would be covered (e.g., use of remote sensing to assist in RMP for a planning unit)? How long should the course be? Who would attend (what level of management)? Any other suggestions?

Summary:

The vast majority of managers who responded to this question indicated that they strongly support a half- to one-day briefing for managers on remote sensing, which would concentrate on how remote sensing has helped to meet Bureau needs. Special attention would be directed to the workmonth and cost savings that are realized using current remote sensing technology. Past and current projects conducted by the Division of Scientific Systems would be discussed from a manager's point of view. Many would like to see this briefing conducted in conjunction with a scheduled meeting.

Comment:

The Division has already taken steps to design a formal management-oriented briefing session on remote sensing, geographic information systems, and computer graphics. The Division has been briefing managers in districts or states with interest in remote sensing projects, but the need to "get the word out" to all has not been met. Present plans call for such a briefing package to be available in early 1983.

Question #7: Independent (self-study) courses.

Another possibility which has been explored only superficially is the use of instructional materials for independent study. Purdue University has produced a Mini-series on Remote Sensing, consisting of 25 slide/cassette tape exercises covering many aspects of remote sensing. The BRS and the DSC Learning Center have copies of these exercises.

There are a number of discipline-specific workshop exercises developed at the EROS Data Center. Most of these consist of imagery (Landsat and conventional photography), overlays, and exercises. Excellent materials are also available elsewhere.

(for all) What are your recommendations along this line? Should a library-type system be used to lend out materials from a central location, and/or should materials be obtained locally? Should videotapes be considered? Do the Districts and States have access to this equipment? Any other recommendations?

Summary:

Independent, self-study training materials were viewed positively by an overwhelming majority of respondents. Many indicated that employees who will be unable to attend the formal sessions can take advantage of these materials. Most offices indicated that they have the necessary equipment for both slide/cassette and videotape presentations.

Comment:

The Division was somewhat suprised at the strong positive response to this question.

Generally, we feel the self-study method is not well suited to Bureau remote sensing training. An essential part of the 9180-8 (Introduction to Remote Sensing Techniques) course is the field trip, during which the students can compare their photo-interpretations with what is really on the ground. In a self-study situation, this would rarely be possible.

For the digital image processing courses (9180-13), heavy emphasis is placed on equipment in the lab, including hands-on exercises. Color plays a major role in this work, and rendition through visual media (slides, videotape, etc.) could suffer.

In addition, materials from commercial sources cannot possibly begin to cover Bureau-specific applications. They may, however, prove very adequate to explain theory or general principles.

In our opinion, the strong support for self-study courses is due partly to the considerable difficulty most employees have in attending the present courses (travel limitations again) and the feeling that the next best alternative (to no training at all) is self-study.

A locally-held introductory or intermediate level course would probably be a preferred alternative when such courses can be arranged. Realistically, however, there will still be a large number of employees whose only possibilities for remote sensing training will be through independent, self-study materials.

In response to these observations, the Division will:

1. Compile a list of vendors of remote sensing materials and hopefully obtain brochures to be sent to the individual State remote sensing coordinators and/or training officers. With this information states could decide which materials they might want to purchase for their Learning Centers.

2. Make available on a library-lending system the self-study materials currently available in the Division, consisting of the 26-part Purdue Mini-series and some EROS Data Center exercises. For some of the more specialized exercises, it may be sufficient to circulate the Division's copy. For exercises in heavy demand, states may want to have their own copy for distribution to their districts.

3. Consider the practicality of videotaping one of the 9180-8 introductory courses and the 9180-13 digital course, making copies available to State Learning Centers as needed.

Last question: Any other comments you might have with regard to remote sensing training would be greatly appreciated.

Summary:

Though this was an open-ended question, certain responses were fairly frequent and are summarized below.

Some respondents mentioned that the Bureau remote sensing effort should get better publicity--not only the work being done within the Division (Branch of Scientific Systems Applications, D-442, and Branch of Scientific Systems Development, D-441), but also in the District and State Offices. Suggestions were made for a Bureau-wide newsletter of some kind.

Several comments underscored the importance of training being relevant to the specialist in the field office. Some mentioned the need for management to be involved and approve remote sensing. Some complained that the equipment and techniques discussed in some of the courses are not available in their districts.

Comments:

The need to keep Bureau personnel informed on Bureau remote sensing work was also expressed at a May meeting in Phoenix for remote sensing coordinators and ADP coordinators. One of the recommendations was that WO-870 (the Washington Office Remote Sensing Coordinator, Dave Allen) prepare and distribute periodic progress and information reports, including contributions from State Offices and DSC about on-going projects, new developments at DSC, and discussion of current issues. A "trial balloon" newsletter was sent out in January 1982.

In addition, an information memo is being prepared to give field offices an overview of the Bureau remote sensing organization. The memo should help answer questions on who to contact, general cost figures for past projects, etc.

SUMMARY

Question #1: Assuming existing courses continue to be offered in the same geographical locations during the months indicated, how many students from your District or State Office would you send to each course per year?

State	9180-8 Monument, Colorado	9180-8 Reno, Nevada	9180-8 Tucson, Arizona	9180-10 Sioux Falls, South Dakota	9180-13 Denver, Colorado
Alaska	0	0	0	0	0
Arizona	0	0	4-5	1	2
California	0	5-10	2	4-5	5
Colorado	7-12	0	0	1	3-6
Idaho	0	8-10	2	4	4-7
Montana	0	0	0	1	2
Nevada	2	8-12	0	3	3
New Mexico	0	0	2-3	3	2-3
Oregon	1	2	0	1	1
Utah	1	0	1	1	2
Wyoming	1-5	1	0	1-5	2-8
?	6	0	0	1	3
Eastern States	0	0	0	2	2
BIFC	0	0	0	0	2-3
OCS	0	0	0	0	0
Totals:	18-27	24-35	11-13	23-28	33-47

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Alaska					
Anchorage DO	0	0	0	0	0
ASO (Branch at Easement, ID)	0	0	0	0	0
? (Alaska)	0	0	0	0	0
Totals:	0	0	0	0	0

Comments:

Courses offered locally in Anchorage.

Most potential course participants take BLM-AK course on Basis of Remote Sensing. Similar course is being taught in Alaska.

This course (Remote Sensing for Geologists and Mining Engineers) also offered in Anchorage at EROS field office.

BLM-AK course participants FY 82 were 10 for basic course, 2 for geology course, and 5 for digital course.

===

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Arizona					
Yuma DO	0	0	0	0	0
ASO (Indian Project Office)	0	0	1	0	0
ASO (Resources)	0	0	4*	Maybe 1	Maybe 2
Totals:	0	0	4-5	1	2

*Possibly one from each district.

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
California					
Bakersfield DO-Resources	0	1-2	0	1-2	2
Calif Desert DO	0	0	2	1	1
Redding DO CA-030	0	0	0	0	0
Redding DO	0	2	0	0	0
Redding DO-Res.	0	1	0	0	0
(Redding Totals)	(0)	(1-3)	(0)	(0)	(0)
Susanville DO	0	2-4	0	1	1
Ukiah DO	0	0	0	0	0
Calif. SO	0	1	0	1	1
Totals:	0	5-10	2	4-5	5

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Colorado					
Canon City DO	0	0	0	0	1
Canon City Northeastern RA	2	0	0	0	0
(Canon City Totals)	(2)	(0)	(0)	(0)	(1)
Craig DO	4	0	0	0	1
Grand Junction DO	0	0	0	0	0
Colorado SO - Planning	0	0	0	0	0
Colorado SO -	3-4	0	0	1	2
Colorado SO - 941	1-2	0	0	0	1-2
(Colorado SO Totals)	(1-6)	(0)	(0)	(1)	(1-4)
Totals:	7-12	0	0	1	3-6

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Idaho					
Boise DO-ID01	0	1 (@ 2 yrs)	0	0	1 (@ 2 yrs)
Boise DO	0	2	0	0	1
Cascade RA (Boise)	0	0	2	0	2
(Boise Total)	(0)	(1-3)	(2)	(0)	(1-4)
Burley DO	0	2	0	1	1
Coeur d'Alene DO	0	1*	0	1*	1*
Idaho Falls DO	0	0	0	0	0
Salmon DO	0	2	0	1	0
Shoshone DO	0	2	0	1 (@ 5 yrs)	1 (@ 5 yrs)
Totals:	0	8-10	2	4	4-7

*When travel funds permit.

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Montana					
Butte DO	0	0	0	0	0
Dickinson DO	0	0	0	0	0
Lewistown DO	0	0	0	1	0
Miles City DO	0	0	0	0	1
Montana SO	0	0	0	0	1
Totals:	0	0	0	1	2

Comments:

MSO has offered a substitute for 9180-8 every two years since 1977. Probably will in future if budget permits.

The district would continue to attend the substitute course offered by MSO.

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Nevada					
Battle Mtn. DO	2	2	0	1 (@ 2 yrs)	0
Elko DO	0	2-3	0	0	0
Ely DO	0	1-2	0	1	0
Las Vegas DO	0	2-4	0	0	0
Winnemucca DO*	0	1	0	1	1
Nevada SO-Res.	0	0	0	0	2
Totals:	2	8-12	0	3	3

*With present funding outlook and reductions in travel budgets and with remote sensing applications not well developed, it is doubtful that we will make much use of remote sensing training courses.

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	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
New Mexico					
Roswell DO	0	0	0	0	0
Socorro DO	0	0	1	2	1
New Mexico SO-Resources	0	0	1 (@ 2 yrs)	1 (@ 3 yrs)	1 (@ 3 yrs)
New Mexico SO Info Services	0	0	1	0	1
(New Mexico SO Totals)	(0)	(0)	(1-2)	(1)	(1-2)
Totals:	0	0	2-3	3	2-3

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Oregon					
Baker DO	1	0	0	1	1
Burns DO	0	1	0	0	0
Coos Bay DO	0	0	0	0	0
Lakeview DO	0	0	0	0	0
Roseburg DO	0	0*	0	0	0
Spokane DO	0	0	0	0	0
Oregon DO-Res.	0	0	0	0	0
? (Oregon)	0	1	0	0	0
Totals:	1	2	0	1	1

*Only as need developed in out-years.

Comments: This district does not at this time have funds to expend on travel for courses in remote sensing.

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Utah					
Richfield DO	0	0	0	1	0
Vernal DO	0	0	0	0	1
Utah SO-Res.	0	0	0	0	0
Utah SO Tech Service	*	*	*	*	*
Utah SO - Remote Sens.**	1	0	1	0	1
(Utah SO Totals)	(1)	(0)	(1)	(0)	(1)
Totals:	1	0	1	1	2

*This is difficult to forecast in a time of constrained budgets. Hopefully, a few would be sent each year.

**Figures represent actual attendance which could be expected in any FY based on past participation and future interest vs. restrictions.

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Wyoming					
Casper DO	1-2	0	0	1 (@ 2 yrs)	1 (@ 2 yrs)
Rawlins DO	1	0	0	1 (@ 5 yrs)	0-2
Rock Springs DO	1	0	0	1	2
Worland DO	0	1	0	1	1
Wyoming SO-930	1	0	0	1	1
Wyoming SO*	0	0	0	0	1
(Wyoming SO Totals)	(1)	(0)	(0)	(1)	(1-2)
Totals:	1-5	1	0	1-5	2-8

*State Office estimate for districts was:

	1-2	0	0	1	2

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
Eastern States					
Response #1	0	0	0	2	2
Response #2	0	0	0	0	0
Totals:	0	0	0	2	2

(Question #1)

	9180-8			9180-10	9180-13
	Monument, Colorado (Fall)	Reno, Nevada (Fall)	Tucson, Arizona (Spring)	Sioux Falls, South Dakota (Variable)	Denver, Colorado (Winter)
? (State?)	6	0	0	1	3
BIFC	0	0	0	0	2-3
OCS					
New Orleans	0	0	0	0	0
New York	0	0	0	0	0
Alaska*	0	0	0	0	0
OCS Totals:	0	0	0	0	0

*The Alaska OCS Office, in conjunction with the Anchorage USGS EROS field office and the BLM Alaska State Office, has recently held an introductory remote sensing course in Anchorage. Some 18-20 individuals attended. We have found this method to be convenient to introduce our personnel to remote sensing techniques. As a result, we will probably not send anyone out of state to attend course 9180-8.

In regard to course 9180-10, we foresee no staff requirement for this course.

In regard to course 9180-13, we have one person attending this course in Anchorage this year and will probably have at least one or two individuals attending next year. This course is taught in Anchorage at the USGS EROS field office.

SUMMARY

Question #2: How many of your employees are in need of remote sensing training but probably could not attend the above courses because of certain restrictions? Please specify the nature of these restrictions (e.g., limited funds for training-related travel, workload conflicts, etc.)?

State	9180-8	9180-10	9180-13	Restrictions*
Alaska	0	0	0	Similar courses offered in Alaska.
Arizona	5	5	5	Limited funds and other priorities.
California	38-52	11-15	12-14	
Colorado	3-4	0	1-2	
Idaho	46-58	5	21-29	
Montana	11-13	7-8	13-15	Limited travel funds.
Nevada	56	11	5	Limited travel funds.
New Mexico	8	2	1	Budget, low priority.
Oregon	19-22	3	4	Limited travel funds.
Utah	30-93	4-8	1-5	Limited funds.
Wyoming	43-55	5	10-24	Limited funds.
?	10	0	5	
Eastern States	0	0	0	
BIFC	0	0	0	
OCS	10	1	1	Restrictions on taking uplands-oriented programs.
Totals:	279-386	54-63	79-110	

*Most frequent response noted. See individual state's comments for more specific information.

ALASKA

9180-8

Anchorage DO	0*	Similar course offered in Alaska; Travel outside Alaska restricted.
ASO - Br. of Easement Identification	0	Two will attend course developed by Alaska next year.
? (Alaska)	0	
Total:	0	

*3-5 when locally offered. Due to travel restrictions, BLM personnel (Alaska) take advantage of similar courses offered in Alaska.

Estimated yearly average for corresponding Alaska course: 10

9180-10

Anchorage DO	0*	Similar course offered in Alaska; Travel outside Alaska restricted.
ASO - Br. of Easement Identification	0	"
? (Alaska)	0	"
Total:	0	

*One per year when locally offered. Due to travel restrictions, BLM personnel (Alaska) take advantage of similar courses offered in Alaska.

Estimated yearly average for corresponding Alaska course: 2

9180-13

Anchorage DO	0*	Similar course offered in Alaska; Travel outside Alaska restricted.
ASO - Br. of Easement Identification	0	"
? (Alaska)	0	"
Total:	0	

*Two per year when locally offered.

Estimated yearly average for corresponding Alaska course: 5

ARIZONA

9180-8

Yuma District	0	
ASO - Indian Project Office	0	
ASO - Resources	5	Limited funds for training-related travel; workload conflicts; other travel or training priorities; lack of either AM or DM prgram support.
Total:	5	

9180-10

Yuma District	0	
ASO - Indian Project Office	0	
ASO - Resources	5	Limited funds for training-related travel; workload conflicts; other travel or training priorities; lack of either AM or DM prgram support.
Total:	5	

9180-13

Yuma District	0	
ASO - Indian Project Office	0	
ASO - Resources	5	Limited funds for training-related travel; workload conflicts; other travel or training priorities; lack of either AM or DM prgram support.
Total:	5	

CALIFORNIA

9180-8

Bakersfield Dist-Res	1-2	Travel funds
California Desert District	20	Limited funds for training-related travel.
Redding (CA-030)	6-8	Travel $
Redding	5	Travel and budget
Redding - Div. Res.	4	Travel, workload priorities
(Redding Total:	4-17)	
Susanville District	10	Probably limited funds for training-related travel.
Ukiah District	0	Travel limitations
Calif. SO - Admin. Div.	3	Travel restrictions for training.
Total:	38-52	

9180-10

Bakersfield Dist-Res	1-2	Travel funds
California Desert District	6	Limited funds for training-related travel.
Redding (CA-030)	1	Travel $
Redding	2	Travel and budget
Redding - Div. Res.	1	Travel, workload conflict
(Redding Total:	1-4)	
Susanville District	1	Probably limited funds for training-related travel.
Ukiah District	0	Travel limitations
Calif. SO - Admin. Div.	2	Travel restrictions for training.
Total:	11-15	

CALIFORNIA (Cont.)

9180-13

Bakersfield Dist-Res	2-4	Travel funds
California Desert District	5	Limited funds for training-related travel.
Redding (CA-030)	1	Travel $
Redding	0	
Redding - Div. Res.	0	
(Redding Total:	1)	
Susanville District	1	Probably limited funds for training-related travel.
Ukiah District	0	Travel limitations
Calif. SO - Admin. Div.	3	Travel restrictions for training.
Total:	12-14	

9180-8

Canon City District	0	
Canon City (Northeast RA)	2*	
(Canon City Totals)	(2)	
Craig District	**	Travel and training funds.
Grand Junction District	0	
CSO - Planning	0	
CSO	1-2	None
CO-941	0	So far, we have been able to send the ones that need it.
(CO SO Totals)	(1-2)	
Total:	3-4	

*Course keeps getting cancelled (twice this year)!

**The actual number of employees actually needing training needs to be determined.

9180-10

Canon City District	0	
Canon City (Northeast RA)	0	
Craig District	*	Travel and training funds.
Grand Junction District	0	
CSO - Planning	0	
CSO	0	
CO-941	0	So far, we have been able to send the ones that need it.
Total:	0	

*The actual number of employees actually needing training needs to be determined.

9180-13

Canon City District	0	
Canon City (Northeast RA)	0	
Craig District	*	Travel and training funds.
Grand Junction District	0	
CSO - Planning	0	
CSO	1-2	None
CO-941	0	So far, we have been able to send the ones that need it.
(CO SO Totals)	(1-2)	
Total:	1-2	

*The actual number of employees actually needing training needs to be determined.

==

IDAHO

9180-8

Boise District ID-01	2	Workload and funds
Boise District	10	Travel; other high priority work
Cascade RA (Boise)	2	Funds and workload
(Boise Total:	2-14)	
Burley District	5	Limited funds
Coeur d' Alene District	15	Training-related travel
Idaho Falls District	15	Training-related travel
Salmon District	8	Limited funds for training-related travel.
Shoshone District	1	Limited travel funds.
Total:	46-58	

9180-10

Boise District ID-01	0	
Boise District	0	No geologist or engineer
Cascade RA (Boise)	0	
(Boise Total:	0)	
Burley District	0	
Coeur d' Alene District	0	
Idaho Falls District	3	Training-related travel
Salmon District	2	Limited funds for training-related travel.
Shoshone District	0	
Total:	5	

9180-13

Boise District ID-01	2	Travel
Boise District	5	Workload and funds
Cascade RA (Boise)	3	Funds and workload
(Boise Total:	2-10)	
Burley District	5	Limited funds
Coeur d' Alene District	10	Training-related travel
Idaho Falls District	3	Training-related travel
Salmon District	1	Need for training (may not be applicable to this district; limited funds for training-related travel).
Shoshone District	0	
Total:	21-29	

MONTANA

9180-8

Butte District	3	Excessive cost
Dickinson District	4	Limited funds for training-related travel and MSO has about the same course.
Lewistown District	0	Need/travel cost (offered MSO)
Miles City District	4-6	Limited funds for training-related travel
MSO	0	
Total:	11-13	

9180-10

Butte District	1	Excessive cost
Dickinson District	1	Limited funds for training-related travel.
Lewistown District	3	Need/travel cost (one per year)
Miles City District	1-2	Limited funds for training-related travel
MSO	1	Travel costs
Total:	7-8	

9180-13

Butte District	3	Excessive cost
Dickinson District	3	Limited funds for training-related travel.
Lewistown District	1	Need/travel cost
Miles City District	4-6	Limited funds for training-related travel
MSO	2	Travel costs
Total:	13-15	

NEVADA

9180-8

Battle Mountain District	20	Travel fund shortage
Elko District	3	Limited funds for training-related travel.
Ely District	20	Budget and time
Las Vegas District	10	Limited training and travel funds
Winnemucca District	3	Funds - travel and activity
NSO - Resources	0	
Total:	56	

9180-10

Battle Mountain District	4	Travel fund shortage
Elko District	1	Limited funds for training-related travel.
Ely District	2	
Las Vegas District	3	Limited travel funds
Winnemucca District	1	Funds and travel budget limits
NSO - Resources	0	
Total:	11	

9180-13

Battle Mountain District	2	Travel fund shortage
Elko District	1	Limited funds for training-related travel.
Ely District	0	
Las Vegas District	2	Limited travel funds and no projects currently on line.
Winnemucca District	0	
NSO - Resources	0	
Total:	5	

NEW MEXICO

9180-8

Roswell District	0	
Socorro District	8	Budget
New Mexico SO - Resources	0	
New Mexico SO - Info. Serv.	0	
Total:	8	

Comments: If my employees are in need of this training because of it being a high priority, they would be scheduled to attend. Generally, remote sensing training has not attained a high enough priority at this time to be affected by the limits of restrictions mentioned.

FY 82 - No programming in AWP.

FY 83 - The Remote Sensing function at the State level from guidance and direction standpoint is to be in the Branch of Information Services. The staff involved in this function should be participants in training to the level appropriate.

9180-10

Roswell District	0	
Socorro District	2	Budget
New Mexico SO - Resources	0	
New Mexico SO - Info. Serv.	0	
Total:	2	

9180-13

Roswell District	0	
Socorro District	1	Budget
New Mexico SO - Resources	0	
New Mexico SO - Info. Serv.	0	
Total:	1	

9180-8

Baker District	7	Training-related travel
Burns District	0*	Limited funds for training, and travel funds.
Coos Bay District	1	Limited funds, low priority
Lakeview District	0	This district does not at this time have funds to expend on travel for courses in remote sensing.
Roseburg District	0	Training-travel funds.
Spokane District	1	Limited funds for travel.
OSO - Resources	8-10	(Cultural Res. Specialists) Budget.
? (Oregon)	2-3 /year	Limited travel funds.
Total:	19-22	

*Need is not immediate and our experience with past attendance is that knowledge gained tends to be lost because of present limited opportunity to make use of aerial photos for more than just basic purposes. In the future we will plan to make use of this course only when we anticipate an immediate workload utilizing knowledge to be gained from the course by a group of employees.

9180-10

Baker District	1	Training-related travel
Burns District	1	Limited funds for training and travel; other priority training needs.
Coos Bay District	1	Limited funds, low priority
Lakeview District	0	
Roseburg District	0	
Spokane District	0	
OSO - Resources	0	
? (Oregon)	0	
Total:	3	

9180-13

Baker District	3	Training-related travel
Burns District	1	Limited funds for training and travel, limited opportunity to apply knowledge gained.
Coos Bay District	0	
Lakeview District	0	
Roseburg District	0	
Spokane District	0	
OSO - Resources	0	
? (Oregon)	0	
Total:	4	

==

9180-8

Richfield District	43	Limited funds for travel and major workload conflicts.
Vernal District	15-20	Funding limitations--overall budget, travel, etc.; work commitments.
Utah SO - Resources	0	
Utah SO - Tech. Serv.	0	Travel budget and training budget.
Utah SO* - Remote Sensing	30	Limited funds, management interest.
? (Utah)	0	
Total:	30-93	

*State Office estimate for entire state.

Comments: Restrictions exist in the form of travel budgets and training budgets.

9180-10

Richfield District	4	Workload conflicts.
Vernal District	0	
Utah SO - Resources	0	
Utah SO - Tech. Serv.	0	
Utah SO* - Remote Sensing	4	Limited funds, management interest.
? (Utah)	0	
Total:	4-8	

*State Office estimate for entire state.

9180-13

Richfield District	0	
Vernal District	1	Budget limitations and work commitments.
Utah SO - Resources	0	
Utah SO - Tech. Serv.	0	
Utah SO* - Remote Sensing	4	Limited funds, management interest.
? (Utah)	0	
Total:	1-5	

*State Office estimate for entire state.

WYOMING

9180-8

Casper District	5	None
Rawlins District	0	None
Rock Springs District	3	Funds
Worland District	30	Limited funds for training.
Wyoming SO-930	0	
Wyoming SO*	5	Travel funds, workload conflicts.
Total:	43-55	

*State Office estimate for all Districts combined: 50-100.

9180-10

Casper District	2	None
Rawlins District	0	None
Rock Springs District	0	
Worland District	3	Limited funds for training.
Wyoming SO-930	0	
Wyoming SO*	5	Travel funds, workload conflicts.
Total:	5	

*State Office estimate for all Districts combined: 5.

Comments: The geological course should be more directed to BLM's needs.

9180-13

Casper District	2	None
Rawlins District	0	None
Rock Springs District	0	
Worland District	22	Limited funds for training.
Wyoming SO-930	0	
Wyoming SO*	0	Travel funds, workload conflicts.
Total:	10-24	

*State Office estimate for all Districts combined: 10-20.

Comments: Probably best to train those who have projects planned for their district.

==

? (State ?)

9180-8	10	Travel
9180-10	0	
9180-13	5	Travel

EASTERN STATES

9180-8

ESO - Response #1	0
ESO - Response #2	0
Total:	0

9180-10

ESO - Response #1	0
ESO - Response #2	0
Total:	0

9180-13

ESO - Response #1	0
ESO - Response #2	0
Total:	0

BIFC

9180-8	0
9180-10	0
9180-13	0

OCS

9180-8

Alaska	0	*
New Orleans	10	We are restricted from taking uplands-oriented courses.
New York	0	Upland-oriented courses serve little purpose on the OCS.
Total:	10	

*The current fiscal climate would preclude more than one or two persons per year to travel outside of Alaska for remote sensing training. A review of question one will indicate that outside travel in regard to these introductory courses is not a problem as they are held in Anchorage.

9180-10

Alaska	0	
New Orleans	1	We are restricted from taking uplands-oriented courses.
New York	0	Upland-oriented courses serve little purpose on the OCS.
Total:	1	

9180-13

Alaska	0	
New Orleans	1	We are restricted from taking uplands-oriented courses.
New York	0	Upland-oriented courses serve little purpose on the OCS.
Total:	1	

Question #3: The 9180-8 course (Introduction to Remote Sensing Applications) includes a 1-day field trip, which is an integral part of the course. Because of field site accessibility problems, generally a winter date is not feasible. Scheduling during the other months is flexible and hopefully can be done to avoid conflicts with the field season. (9180-10 and 9180-13 do not incorporate a field trip).

(for all) What specifically would you change as far as course content or course length? Is the time of the year when the courses are offered convenient?

9180-8: INTRODUCTION TO REMOTE SENSING APPLICATIONS

ALASKA

- Field season in Alaska is mid-June thru mid-August. Not wise to include in this time frame. Best dates Nov-March.
- Too ambitious!
- Reduce Super-Tech on photogrammetry, photogeometry, stereoscopy, rectified/orthophoto process, statisical sampling super details.
- Center on resource specialist needs at novice level.
- Remember. This is a basics course to generate enthusiasm and learning. Not a "see how grand we are" type course.

Course length and location was satisfactory; desired more specifics on right-of-way location based on aerial photos topo's, etc., and identification and location of existing trails, etc., based on aerial photo's.

No change, yes.

===

ARIZONA

Yuma District has little experience with the specific training courses listed in your questionnaire. One district employee did get on-the-ground experience this past year in connection with the remote sensing project in the Havasu Resource Area but we see little future work occurring in this activity because of the present de-emphasis on inventories.

This course is generally too long and too basic for most resource people. Subject matter is very well covered but most students have taken some kind of beginning photo-interpretations in school. The uses of aerial photography under steroscopic vision is very much under emphasized in the Bureau. Ortho photoquads are also not used as much as they should be, especially considering how much is currently available at District Offices. The utility of both low elevation (1:300', 1:600' or 1:1200') and high elevation photography, when available, should be incorporated. To be the most Bureauwide beneficial, this course should be made applicable to Bureau responsibilities. In Arizona, the training center has satisfied many of the above needs during related workshops. Our recommendation is to combine 9180-8 and 9180-13 into a one-week introductory course in remote sensing. This will incorporate all of 9180-8 at a more advanced and shorter level. He will also cover some of 9180-13 but not in as much specific detail.

No change in course.
Spring of '82 in Tucson is most desirable.

===

CALIFORNIA

Seems appropriate.

1) Different disciplines need more in-depth coverage, i.e., Biologists/ Botanists needs are different from Hydrology, soils, etc.
2) The materials prepared for the course are excellent but we don't have them in the District Office. The course work does not cover the quality of material available to us--frustrating.
3) The field trip was skimmed and certainly could be more thorough.
4) The time of year is lethal to those resources which have a strict field season requirement, i.e.: April-Aug is impossible for field staff.

No suggestions for improvement. Have not attend courses. Could better make suggestion after taking training. It is hard to look at a course schedule and know exactly is being presented.

Course content--sometime should be spent on problems relating to specific issues within the District.

Not intemintly familiar with content or presentation.

Very limited need for this type of skill--basics can be taught by O.J.T.

With only the brief outline of the course you provided--I can't really comment on course content or length. But if remote sensing is to be used by the BLM this training must get to each State where Districts can afford to send their personnel.

Excellent course.

No idea.

===

COLORADO

Course Length - I think there is a need for a short (± 2 days) course, that would be appropriate for the majority of BLM resource specialists. Perhaps this could be presented at the District level by BLM instructors. Also, independent courses (on at least a compilation of tests and references for BLM uses) should be made available.
Content - Engineering staffs could benefit from discussions of aerial surveying methods, setting of control points, and photogrammetry processes.
Location and Time - No problem.

Present course content and scheduling fulfills our current needs.

Reports from previous attendees are favorable. More specific comments are not available. Time of year is ok.

Shorten the introduction and background portions. Most, if not all, resource specialists have at least a general knowledge of aerial photos. The course should introduce color IR, high altitude, and Landsat.

OK

Change course length to 3 to 4 days. Winter would be the preferred time for this training. Course content appears quite adequate.

===

IDAHO

I have not attended this course.

Basically a good course. A short session on the acquisition of conventional aerial photography would be useful. A section of this type would enable the user to better judge the quality of acquired data as well as make allowances during use. The section on Landsat could be reduced to avoid duplication of 9180-13. The time of year is appropriate.

Nothing; ok.

Ok

I would change nothing on this course. I think it is an excellent introduction to Remote Sensing.

Would not be able to change anything at this time. Time of year would be satisfactory.

[Five] 5 days in a training course is a long time unless its held locally or at least within each State--prefer locally and cut to 3 days max.

==

MONTANA

We have been offering a similar course in Montana every 2 years in 1977. The reason for the course was that our personnel were not getting to go because of the out-of-state travel costs. The agendas are very similar. A one-day field session is part of our course also. Your agenda looks good. Many of our personnel need a course such as this since the schools do not provide much training in this area now.

This course seems to assume that BLM specialist have never been exposed to API or Remote Sensing. Eugene Avery's book, used by most Universities in API courses could be substituted. It is doubtful that a five-day course could give specialist the necessary knowledge to use CIR and false color IR effectively especially if no formal background in API was gained in college. I would drop this course from regional training and replace it with State Office level training.

Soil surveys and related interpretations can be used to explain many of the features discussed on terrain analysis, landform features sampling of remotely sensed data, geographic information and data transfer.

==

NEVADA

The reports from previous attendees is that this course as presently structured is desirable only for those with little or no previous training or experience in photogrammetry. Many have had college courses. A one month later offering would be more convenient.

Date fine. What we need at the field level is that knowledge that is necessary to be able to aerial photos and imagery effectively at the field level to this and get our job done in the most efficient and comprehensive way. Outline looks good not too much history and background data.

Course content should place more emphasis on analysis of desert environments. Airphoto training should show projects that have been monitored over a period of years for trend and condition.

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

NEVADA (Cont.)

Place main emphasis on use of existing aerial photography for different disciplines.

No changes suggested.

Time of year ok. This is probably the most practical course for most employees. Efforts should be made to keep it practical.

NEW MEXICO

9180-8 course not approved AWP 82.

Knowledge about the effectiveness of course content to field use not known at this time due to lack of sufficient experience with completed training by New Mexico staff; only one district has used remote sensing technology.

Nothing, good course.

Cannot answer because of lack of detailed knowledge of course content. This kind of question should be asked of trainees at end of each training session.

OREGON

For our purposes the length could be reduced to two days and include the following portions shown on course outline. Dec. or Jan. would be best time:

Exercise #4: Image Characteristics
Lecture: Terrain Analysis and the Mapping Process
Exercise #5: Drainage Patterns
Exercise #6: Landform Features
Lecture: Vegetation Resource Mapping
Exercise #7: Vegetation Resource Mapping
Lecture: Photo Interpretation Technique and the BLM Planning Process
Recommend: (Susanville Case Study)
Univ. Cal. Berkeley Contr. USGS-BLM-NASA-Coop.
Lecture: Landsat Digital Image Analysis
Lecture: Sampling from Remotely Sensed Data
Lecture: Field Trip to Clover Valley, Calif.
Lecture: Evaluation of Field Trip (Classroom)
Lecture: Data Acquisition
1. Sources of Photos and Orthophotos
2. Ordering and Inspecting New Photography
3. EROS Data Center Products

OREGON (Cont.)

No change suggested. Time of year is convenient.

The course is adequate as it is presently offered, although more cultural Res. Mgt. application should be included if C.R.M. specialists are a major part of the participants.

We are not familiar enough with the subject matter to make constructive criticism on these courses.

No changes proposed. Time of year ok.

Most district employees have experience using stereoscopes and aerial photos. Therefore, the course should be concentrated on recent developments. There is a "need to know" that most districts are years behind on state-of-the-art remote sensing.

We have, in the past, sent individuals to subject training. They have returned unimpressed with the program. As to the other questions you ask, we are not sufficiently aware of the value of the program to give a truely valid response.

Offer two curriculums; one for those who have no background in remote sensing and one for those who do. In the latter place most of the emphasis on "state of the art" techniques and on practical application. Offer complete instructor notes to students so they can relax and learn. Limit "hands on" exercises to those done jointly by the instructor and the entire class with a complete set of "school solution" hand-outs to take home. Make introductory courses very practical; "here's what it can do for you" and "here's what it has done for others."

==

UTAH

The course appears to offer the needed information.

Emphasize sound resource mapping procedures.

- More on the importance of properly handling/managing graphic (map) information in terms of cartographic integrity.
- Give some exposure--it might have to be brief--on the concept and function of a G.I.S.--ops--I notice you do already--GOOD.
- Additional comments are difficult without knowing to what depth the topics are covered generally. The agenda looks complete.

I question whether this course as structured is needed and is really helpful. Training should be for the user (district personnel) and contain instruction that helps people use remote sensing. Introduction can be summarized in one day.

1. Change time of course to early summer to take advantage of full growth on vegetation.
2. Emphasize the use of aerial photos and give much less on lands at Remote Sensing and Digital Image Analysis.
3. Expand field work and problems to two days.

The course should be designed to assist the resource specialist in being better able to make use of aerial photos (black and white and color), ortho photos and infrared. We do not have budget or equipment to go beyond that at the present. There is little practicality in providing training except for items that would have day to day application in carry out the District work load.

Basically, anyone who has occasion to use maps, interpret resource data, gather field data, etc., should be exposed. Perhaps the courses could be offered in alternative locations in different years (e.g., Salt Lake - one year out of 3-5). This could result in increased attendance.

WYOMING

Referring to vegetation mapping aerial photos, it would be more realistic if you could draw out on a photo the different vegetation types and then go out in the field and to the follow-up classification of plant communities with major characteristic species so you know what you were seeing on the photos. The time of the year is convenient. I would also recommend not send people to the course if they have already had a semester course of aerial photography in college--it makes it very boring repeating the basics of using aerial photography.

It would be better to have this course offered prior to the field season. March or April. Why do we have a section specific to Vegetation Resource Mapping? Seems like the items discussed here are appropriate to many more applications--i.e., soils, geology, watersheds, plot studies for sediment yield and erosion estimates. Why not consider objectives, scales, type lines, classification systems, etc., and use vegetation mapping as just one of the examples of application--present other examples too! Vegetation is just one small part of our world.

No change.

The course content is adequate and the course length is fine. The time of year when the course is offered does conflict with our fall field season. We normally are still doing field work such as project layout, monitoring studies, etc., up until the middle or last of November. We feel that sometime during the winter period, Dec. 1 to March 1, would be a better time of year to conduct this training.

Would change nothing. Time of year ok, except at Christmas or Thanksgiving.

All P.I. Training should be at the District Office level.

This course should be held at the district office using those tools available at that particular D.O., i.e., if a D.O. has 1:24,000 scale natural color photography available the majority of training should be directed to its use. State office personnel should be used as instructors along with D-234 personnel. This course should be repeated at a D.O. every 3 to 5 years. It should last no longer than 2 to 3 days with some separate sessions for different discipline.

===

?? State

The time of year was convenient. I would like to see the course lengthened to even get into greater depth.

===

ESO

Improvements have been made since I took the course. The course outline looks good. The actual segments of the course depend on what information is contained and the actual presentation.

9180-8 Full courses should be scheduled so that they do not conflict with AWP budgeting time. This is particularly important in the State Offices.

===

OCS

Course availability is fine for people from our office to attend, if courses had some application to OCS work.

The course lengths and times offered for the courses indicated, have been found to be appropriate.

===

9180-10: REMOTE SENSING FOR GEOLOGISTS AND MINING ENGINEERS

ALASKA

No outline to direct comments to.

No change, yes.

===

ARIZONA

This course seems more applicable to the Bureau of Mines or the USGS. They are more involved with mineral or potential mineral locations. Bureau geologists are more involved with mining laws, lease application and compliance. The subject matter would, however, be of interest.

===

CALIFORNIA

Seems appropriate.

With our serious budget/travel funds a closer location like JPL would be valuable--not to mention the severe weather change for most Californians.

No suggestions for improvement. Have not attend courses. Could better make suggestion after taking training. It is hard to look at a course schedule and know exactly is being presented.

Not intemintly familiar with content or presentation.

Very limited need for this type of skill--basics can be taught by O.J.T.

With only the brief outline of the course you provided--I can't really comment on course content or length. But if remote sensing is to be used by the BLM this tng must get to each State where Dist's can afford to send their personnel.

===

COLORADO

I would like to see a course agenda for this.

Part II of this course is perhaps ahead of its time and only has application for major projects. Not many District personnel will have the opportunity to apply the techniques taught.

OK

Change course length to 3 to 4 days. Winter would be the preferred time for this training. Course content appears quite adequate.

===

IDAHO

I have not attended this course.

No comment.

Include geomorphology and watershed related erosion (i.e., landslides mapping and identification of erosional and depositional features, water quality interpretations, infra-red, riparian zones, water exploration.

OK

Not familiar enough with this course to answer.

Would not be able to change anything at this time. Time of year would be satisfactory.

===

MONTANA

Should add section on multi-spectral imagery analysis. Unfortunately, without the availability of color additive viewers this training would be valueless. Also, computer assisted analysis of Landsat data requires availability of sophisticated equipment most of which is lacking by BLM. Travel restrictions allow only limited access to such equipment at the EROS Data Center.

I'm not in a position to evaluate this course.

===

NEVADA

Course 9180-8 should not be a prerequisite for those with previous photogrammetric training or experience. A quick review the first day could be included in 9180-10. Most geologists have the background for 9180-10 without needing 9180-8.

Unless the districts are committed to using Landsat technology and have the resources at hand, including funding for acquiring Landsat imagery, there is little need for this training. Managers must be made aware of and be committed to using current state-of-art technology.

Place emphasis on use in G.E.M. inventory of Wilderness Study Areas.

No first hand knowledge of this course.

Time of year ok. This seems to be a good course, but is long and therefore expensive.

==

NEW MEXICO

Course not approved AWP FY82.

==

OREGON

Have not had a participant attend this course. Can't adequately assess it without some District first hand experience.

Course as provided by USGS/Sioux Falls and LARS/Denver are adequate and meet our needs.

==

UTAH

No one has been to this course.

The course appears to offer the needed information.

Not enough info to comment.

==

WYOMING

Only part II was attended by this district. I would not recommend taking the parts out of sequence. We have not used remote sensing techniques extensively in the minerals programs. Landsat has not been used at all. This is due mainly to manpower contraints.

No change.

The course content, length and time of year are all adequate.

Would change nothing. Time of year ok, except at Christmas or Thanksgiving.

The Geological course should be more directed to BLM's needs. I have interviewed all Wyoming personnel (geologists) who attended this course. They enjoyed all the information and techniques covered, but stated they didn't get much practical information on the Bureau's need for geologic use of imagery analysis. This course could be shorten to one week and developed to meet BLM needs.

==

ESO

9180-10 Full courses should be scheduled so that they do not conflict with AWP budgeting time. This is particularly important in the State Offices.

==

OCS

The course lengths and times offered for the courses indicated, have been found to be appropriate.

==

9180-13: INTRODUCTION TO DIGITAL IMAGE ANALYSIS TECHNIQUES

ALASKA

Pitched at right level for most needs yet keep in mind the target group of an introduction to digital analysis. Stress elemental concepts which influence the process rather than the "button-punching" syndrome.

No change, yes.

* * *

ARIZONA

Excellent course. Generally too technical with too much new information for most BLM'ers. Our recommendation is to combine 9180-8 and 9180-13 into a one-week introductory course in remote sensing. This will incorporate all of 9180-8 at a more advanced and shorter level. He will also cover some of 9180-13 but not in as much specific detail. We would then recommend a state-of-the-art detailed and technical one-week course for the more advance, experienced users. More detailed in image processing than 9180-13.

* * *

CALIFORNIA

Not familiar with course.

This is a very valuable course--if a person could ever get to it. Again those who need it the most are best served Sept-Nov.

No suggestions for improvement. Have not attend courses. Could better make suggestion after taking training. It is hard to look at a course schedule and know exactly is being presented.

Course content--sometime should be spent on problems relating to specific issues within the District.

Not intemintly familiar with content or presentation.

Very limited need for this type of skill. Basics can be taught by O.J.T.

With only the brief outline of the course you provided--I can't really comment on course content or length. But if remote sensing is to be used by the BLM this tng must get to each State where Dist's can afford to send their personnel.

==

COLORADO

I think a shorter course would be appropriate here also for the majority of BLM staffs--perhaps more applications oriented. Greater dissemination of information on available imagery and analysis methods to BLM districts would also be very useful. Course time and location are fine.

A concise summary of problems and their subsequent solution through your system would be of great value to us if included in this course.

Unknown.

Ok

Change course length to 3 to 4 days. Winter would be the preferred time for this training. Course content appears quite adequate.

==

IDAHO

I recently attended this course. I felt it was very well organized. Due to the volume of information associated with the subject, the course could easily be extended to 2 weeks with the last 2 or 3 days entirely spent as a "hands-on" exercise with the image facility hardware. Dave Linden's lecture on "Survey Sampling Application" should have been before Szajgin's "Digital Image Class" lecture.

The material presented in this course could be more adequately covered in a two week course but the length is a reasonable compromise when expenses and budget constraints are considered. The present course content and time of year are appropriate for our needs.

Nothing; ok.

Ok

Attendance at this course should have as a prerequisite a good background in statistics and computer programming.

Would not be able to change anything at this time. Time of year would be satisfactory.

[Five] 5 days in a training course is a long time unless its held locally or at least within each State--prefer locally and cut to 3 days max.

==

MONTANA

This training is definitely not for everyone. A remote sensing coordinator at the SO or District Office level should be trained and be responsible for all digital analysis projects. By appointing one person, travel to Sioux Falls or Denver to utilize computer facilities would not be restrictive. This is a very worthwhile training opportunity for persons already knowledgeable in remote sensing.

Need more emphasis on soils. Soils series are being used to extrapolate many forms of resource data, and potentials of data use must be expanded.

Course agenda looks good. I don't believe any Montana personnel have attended this course. I hope to attend next FY. Time of year is fine since no field work is required.

==

NEVADA

No experience with this course.

I have no effective knowledge of the practicality or uses that can be made of Digital Imagery at the field (area) level.

This course is only useful if management has decided on a specific project. Management will not commit man-month or money to this endeavor unless they can be shown that it is a reliable and cost-effective management tool.

No comments.

NEVADA (Cont.)

No first hand knowledge of this course.

Time of year ok. Course ok but too theoretical for much practical use, by most of our employees. We have a couple who could benefit.

NEW MEXICO

Course not approved AWP FY 82.

Computer time too short. More hands on!

OREGON

Emphasis on practical field application - how do the subjects tie in to actual field situations.

UTAH

Of very little utility to field personnel.

We would perhaps involve one or two persons to help coordinate such things as the Geographic Information system as the State develops capability to implement the system.

The course agendas appear to offer the needed information.

The course outline looks quite complete. I hope you are giving a more honest statistical test when determining classification accuracy than was presented by EROS several courses back.

WYOMING

This is an intensive training on digital image analysis techniques and is only needed or used when the district has ongoing Landsat projects. In that case, the course is appropriate as is.

Would change nothing. Time of year ok, except at Christmas or Thanksgiving.

Looks good.

No change.

The course content, length, and time of year are all adequate.

Probably best to train those who have projects planned for their district. The prime ojbective of this course should be to train those field personnel who are starting active digital projects.

ESO

Outline looks good and has some improvements, longer time for some subjects and less for others.

OCS

The course lengths and times offered for the courses indicated have been found to be appropriate.

No first hand knowledge of this course.

Time of year of course is [illegible] for [illegible] practical [illegible] of most of our employees. We have a couple who would benefit.

[illegible]

[illegible]

Emphasis on practical field application [illegible]

Of *very little* utility to their personnel.

We would perhaps involve one or two persons in this [illegible] such things as the Geographic Information System [illegible] to implement the system.

The course agenda appears to offer the needed information.

The course outline looks quite complete. [illegible]

This is an intensive training on digital image analysis techniques and is only useful [illegible] the district [illegible] Landsat projects. In that case, the course is appropriate as is.

Would change nothing. Time of year OK, [illegible] giving.

Question #4: Possible/Proposed Course:

Introductory course similar to 9180-8 (Introduction to Remote Sensing Applications) course but conducted at a District or State Office.

This type of course has been held in the past, for example at Districts in Colorado and California. Montana and other states have been conducting their own introductory courses for several years, sometimes with DSC assistance. Length of the course has been typically 2-3 days.

(for managers) Would your District or State support this type of basic course if held in your area? How many students would attend this course? What degree of involvement - if any - do you envision for DSC in this new course?

ALASKA

AK presently has a course similar to 9180-8.

This concept of SO/DO offering works in Alaska.

Yes, courses are now offered locally with good attendance (4-6). Limited DSC involvement.

===

ARIZONA

Yes, local training at the Training Center taught by local employees when available. A common training course outline prepared by DSC would be beneficial to all states. DSC would need to instruct the course when local expertise is lacking.

We have recently acquired aerial photo coverage of all District land for the first time. Many employees are not familiar with aerial photo use and would benefit from a 1-day introductory course on this subject.

===

CALIFORNIA

District would suppport this type of course. 10 to 15 students would attend initially. Depending on personnel changes, course would only be given every few years. DSC could initiate course and train remote sensing coordinator in district. Course should probably continue to be given by DSC with assistance of District Coordinator. One entity, DSC, could better keep up on advances or changes in remote sensing.

Many more would be able to attend from DO's and RA's. There are at least 10 resource people who would value this course.

Yes. This District has had such a course, but course objectives and goals needs to be more specific.

Offer at District level sounds best.

Keep it in District so more specialists can attend 2-day course.

This is an excellent concept. I would encourage involvement of my staff. Approx. 4 people are in need of it.

Ukiah D.O. sponsored this concept last year. Results satisfactory to good.

We would support this training at the District level. 10-20 students. We would expect a large degree of involvement from DSC.

COLORADO

Yes, we would support this type of program. The number of students to attend the course would depend on time of year offered, travel restrictions, etc. DSC involvement would be minimal as our state office has in the past suggested such a course.

? No. Not annually.

Course would be good at District Office, remote Resource Area Offices could send their people in. Approx. 2 per year from each R.A.

No further need in Canon City District.

DSC has always done an excellent job of offering and presenting training to our people. I believe our state could support such a class, but the current program more than meets our needs.

IDAHO

Yes, this district would send up to seven students per year if held locally or nearby. DSC involvement should be minimal.

Yes; 20-25 on district; 30+ if open to public; guest lecturers, speakers, trainers, course coordination and scheduling.

15-20 students if held in District; much less if held in S.O. DSC involvement would have to be considerable.

Yes; 10-15. DSC to put course on.

Yes. 25 or 30. DSC should work with our State Office Remote Sensing Specialist to help put on a course of this nature.

10 from Boise District. DSC present 1/2 day on state of the art in BLM on computer interpreted imagery and outlook.

Yes, we would support number of total students not known. I would anticipate DSC heavy load.

5 days in a training course is a long time unless it's held locally or at least within each State--prefer locally and cut to 3 days max. I would think DSC would still present course.

10 would attend. DSC take active role in helping State initially develop the course that meets needs of Districts.

==

MONTANA

Yes. Approx. 6. State Office coordinator would determine DSC involvement.

We send one to three people annually to the MSO introductory level course.

DSC should be prepared to assist with equipment and instruction as required.

Yes, 10
DSC support

Yes. Hold every third year--would be 10 students. Include one from DSC and MSO personnel.

==

NEVADA

Yes. 10 or 20.

This would be a very useful course. Probably have 20-25 students who would attend. Would suggest DSC oprganize and train instructors. Course could be 2-3 days with range, watershed, wildlife, soils, forestry, wilderness, geology and operations personnel in attendance.

Elko District would support such a course if held in the District. We would probably send 20 to 30 students to this type of training. It is assumed that DSC would either conduct the course or assist.

We concur that this type of training, at the district, could be of significant benefit to most of our staff. District staff have limited training capabilities and would be available to assist DSC.

Support 2-day course in Winnemucca or Battle Mt. every other year for 5 people. (Support only where no per diem or heavy travel costs are involved.)

==

NEW MEXICO

Suggest 1 facilitator from DSC
1 Resource Specialist from S.O.
2-10 D.O. participants at D.O. location

Yes. 12. Ensuring that courses are kept up to date!

==

OREGON

If time and travel funds permit are always the bottom line. Probably 2-3 people at first to determine utility of such a course. More people could attend if closer to the districts or if a definite need is developed.

Yes. 10-15 students. We would suggest an introductory course presented by DSC. Suggest course be designed more as a workshop to identify areas of remote sensing use not being taken advantage of by District and make known the current state of the art to employees who have had some exposure to field in college and work.

District would support this type of basic course. 3 students. DSC involvement - training material and support.

Probably not.

Yes.

District course for 12-15 students. DSC would conduct the course with our state office taking over, hopefully, in the near future.

Perhaps, since Baker has the first Resource Mapping Project in Oregon it should be a pilot remote sensing training district with future plans for one on the westside.

UTAH

I'll answer anyway. At the State level we might have sufficient numbers to conduct a course. It, of course, all depends on the attitude of management--which traditionally is quite conservative about things of which they have limited comprehension. About four years ago I conducted a 2-3 day course on aerial photography in all Districts independent of DSC. However, in any new effort, DSC participation would be greatly appreciated.

Yes - we would involve 10-15. We would depend on outside sources for instruction.

No comment.

Could solve the problem of attendance due to travel budgets.

Yes. These courses should be on a District or multi-District basis. We may have 20 employees for a 2-day course. DSC should provide some of the instruction.

WYOMING

We would support it. 1 student per year. DSC should provide instructors and materials. Only those employees who have never had photo interpretation course.

More students would attend the course if held in Cheyenne than in the other specified locations.

1. Yes, if reduced to 1-1/2 days.
2. 10 to 15 people
3. ?

The Worland District would support the idea about holding a basic course at either the District or State level. We would initially have 30 employees needing this training. Thereafter, the number would drop to 3-5 per year depending on the number of new employees we have in the District. DSC would have to provide the expertise and instructors.

Estimate 15 students would take course. DSC involvement would depend on expertise which State and/or District Office lack.

Should be co-oped between State Office, Remote Sensing Coordinator, and DSC staff. A 2- to 3-day course (in winter) could have up to 25 students at a D.O.

Wyoming conducts its own courses, but should use DSC assistance in the future.

As stated before, all introductory courses should be held at the local office level to get the most direct benefit from the course and also the least travel cost.

===

ESO

No need for this type of course.

The idea is good. ESO would not have much actual need for such a course, however, they might have someone in need of this and could send one or maybe two people some years.

===

OCS

If a course were designed specifically for the OCS, there might be 10-15 people from this office able to participate in a course held in New Orleans. I would like to work with DSC in preparation of such a course for the OCS offices.

Obviously we would. We have a high staff turnover and could send 5-10 individuals per year to a 9180-8 type of course. We would recommend that the course be 4 days in length and present topics pertinent to geology, oceanography, planning, and biology. Primary area of focus should be the coastal zone and its processes. We have found remote sensing techniques to be a valuable tool for environmental analysis. We are currently involved with the interpretation of Landsat data and have been pleased with the results. We believe it would enhance the mission and capability of our office to have our staff thoroughly familiar with remote sensing techniques.

===

[Possible/Proposed Course: Introductory course at District or State Office.]

(for all) How long should the course be? What different disciplines would be represented? What topics should be covered? Any other suggestions?

ALASKA

5 days. Desired more specifics on right-of-way location based on aerial photos topo's, etc., and identification and location of existing trails, etcs. based on aerial photos.

4 days about right. Keep continuity of course content by stressing basics as directly applied to the BLM mission.

3-5 days; landcover/soils/geomorphology mapping. Add lands applications.

ARIZONA

2 days - all resources staff without previous training (10 to 15 people). 9180-8 outline. New employees - 2 days.

There would be 10-15 employees involved in this session. Employee disciplines would include Recreation, Wildlife, Realty, Cultural and others.

CALIFORNIA

Resource specialists should be aware of what is available within the District and how to obtain it. Explain the various uses possible with remote sensing imagery. Work on specific issues and ways to solve these issues with various imagery.

Course could be 2 to 3 days. For this district, range, wildlife, forestry, minerals, archaeology, and fire are the primary disciplines to be represented. Topics to be covered would be basic introduction to remote sensing and aerial photography, photo interpretation and measurement, land forms, vegetative mapping.

3 days basic lecture and exercise
1-2 days field work
Biological (wildlife and botanists)
Soil & Hydrology
Lands; Archeology, Recreation, Range, Geology & Minerals
All the resources could use this info.
* The course should emphasize the materials that we actually have available, i.e., we have no color IR. We need it but let us what we do have the $ for.

3-5 days. Users or potential users of remote sensing from all specialities including remote sensing coordinators and data processing support personnel (the latter need to know basics to help support users).

3-4 days - directed at only 1 discipline at a time - too broad of a course defeats the objectives, all foresters, all range cons., all wildlife bio., etc.
Topics - those items the specialist needs to complete his job easier and cheaper.

Minimum of 3 days; all disciplines; emphasis shall be on the uses of photos and development of skills to use them.

2-3 days for intro. course.

==

COLORADO

The course should be no longer than 3 days. Most disciplines would be represented if possible. All topics that are available should be discussed but of particular value would be a very complete study of the use of aerial photography that is available.

? 2-3 days ok

1 wk. long; range, forestry, minerals, recreation, etc.

A 2-day course could be developed emphasizing availability of remote sensing imagery and resource applications and methods. Theory and specialized equipment should only be briefly discussed (perhaps handouts). For this type of course, all BLM staff disciplines should be treated equally (a course of this type can only address rather general methods), but there may be at times a need for specialized course for specific resource specialists.

2-3 days should be adequate. In addition to basic material, topics and applications typical of the geographic area wold be most appropriate. Perhaps examples from actual remote sensing projects in the area would be helpful.

==

IDAHO

Idaho is planning to set-up "Intro. to Remote Sensing Workshops" - about 2 days in length for District and Area personnel at the Districts. Travel and budget restrictions probably will make it less feasible to have a workshop of ISO-Boise. The ISO Remote Sensing Specialist will coordinate workshops with the Districts. It is hoped DSC-BRS personnel may be able to assist in these workshops, similar to Montana's program. Workshops would address specific remote sensing needs and interpretive techniques useful to that District's program.

The necessary material could be covered in a 2-3 day course. Range, wildlife and recreation would be the primary discipline represented but lands, soils and forestry may also be involved. Application of photography and its practical uses should be emphasized. Photogeometry, stereoscopy, mapping (primarily vegetation) and transfer of data to base maps are topics which should be stressed. Our needs are for a streamlined course that stresses the basic concepts.

2-3 days; all different Resource disciplines; emphasis on interpretation and mapping; procedures on photo imagery acquisition, setting up a photo mission; acquisition of photo enlargements, applications of saving time energy and money in field work; need for budgeting $ for photo needs $ requirements.

Estimate - 3 days. This course should replace 9180-8.

3-5 days
disciplines include: range >
forestry > vegetation patterns
geology > and measurement
wildlife >
Emphasize how to use, interpret, and maintain photos properly.

2-3 or 4 days. Mostly foresters with sprinkling of other disciplines.

Course length should be no more than 2 days. All disciplines gathering field data. Course topics - IR, photogeometry & Image Measurements, Steroscopy, Image Interpretation, Terrain Anaylsis Veg Mapping, Data Transfer from photos to Base Maps, Introduction to Landsat.

2-1/2 days
All resource disciplines.
Topics should be determined by DSC.

3 day. Photo interpretation capability. Marking on photos. Tones, surfaces, type of photography (B&W, Color IR, True Color). Project location by photo.

==

MONTANA

≤1 week, Soils, Range,
AMP monitoring
Soil & Watershed analysis

==

I suggest 2-1/2 - 4 days. For a basic course I feel any and all disciplines should be represented. Concentrate on practical, hands-on exercises on photogeometry and stereo viewing. A field exercise is required.

3 days
Range
Watershed
Minerals
Forestry
Cultural
Recreation/Wilderness

==

NEVADA

One week or less. Geologists, wildlifers, range cons., archaeologists, range and engineering technicians, foresters.

Two or three days would be appropriate. Specialists in range, soils, minerals, wildlife, forestry, and cultural resources would benefit. Should have an emphasis on the use of aerial photos and orthophotoquads with some introduction to LANDSAT imagery and related opportunities.

2 days is sufficient. Range, forestry, minerals, recreation, soils, hydrology, engineering, wildlife.

- Use of airphotos for habit analysis and land use planning, and soils and vegetation mapping.
- A 4-hour introduction to Landsat and its' applications should be tailored to make management aware of the state-of-the-art.

2-3 days course. Should be broken out into use of aerial photos and Digital imagery - probably a two-day course on each subject will be sufficient.

Two days. We need to know about actual applications of remote sensing on BLM jobs.

Dates of training duration good. Should include:
1. Wildlife boilogists (habitat identification)
2. Forestry (clearcutting monitoring, stream sedimentation ID, wildfire burns
3. Range (veg. mapping/monitoring, productivity estimates
4. Geologists/Hydrologists (lineament analysis, alteration pattern evaluation

===

NEW MEXICO

This is a need for some basic training in aerial photogrammetry as related to several kinds of basic resource studies and use in the field. These should be targeted as resource specific, i.e., cultural, range, geology. More advanced studies are probably not needed since this work will usually be done by contract.

Usually 2 days
(1) geology, minerals
(2) cultural, natural history
(3) range, soil, watershed vegetation

Not more than 3 days. Field applications, no project layout, contracting, focal lengths, etc., training to use existing products.

Use experience from other states to set course length and content. If held at a district or S.O., a wide range of disciplines would be present.

===

OREGON

2-3 days. Range Cons., Foresters, Wildlife Biol., Rec. Planner, Realty Spec., Minerals Spec., Engineering Tech.

Three days would be long enough for C.R.M. specialists since some of the most elementary material could be eliminated. Most C.R.M. specialists have had some remote sensing training.

2-3 days.
All disciplines.
Material availability and what it can be used for.

OREGON (Cont.)

Course length should be 3 days with all disciplines represented. Topics could include use of remote sensing in:
1. Land treatment, timber sale, etc., contract prep., exhibits, PR and admin.
2. Basic resource inventories
3. Monitoring
4. PR

Length: 2-3 days. Forester, Range Conservationist, Soil Scientist. Introductory photo interpretation.

==

UTAH

2-3 days long. Be an instruction on practical use of system.

Probably 2 days. Range, Wildlife, Watershed, Recreation operations. We would definitely prefer this approach. It is not likely that we would send more than one or two, if any, to the regular scheduled courses based on our track record with training plans.

An introductory course should be 4-5 days long. Basic resource applications should be covered - i.e., soil, wildlife, vegetation (range). Topics should emphasize those aspects which have direct application at the field level - i.e., aerial photography, photo interpretation, resource mapping procedures, data management.
Perhaps an abbreviated overview (either presented along with the intro course or as a seperate effort) could be presented for managers.

1. 2-3 days for Basic Introductory Aerial Photo course.
2. Range, wildlife, soil, water, recreation, and engineers.
3. a. Introduction to Aerial Photography
    b. Stereoscopy
    c. Calculating scale and image measurements
    d. Image interpretation
    e. Mapping process
    f. Transferring data to base map

At least 5 days. It could represent soil conservation, all resource specialists, cartographers, surveyors, etc.
Cover interpretation topics.

==

WYOMING

2 days all resources

Same as Appendix I [current 9180-8 course]

The course length should be 3 days. All disciplines would be represented. Topics to be covered should be the same as in course #9180-8. The big advantage to this type of training is that everyone in the District would become familiar with remote sensing and consequently, make more efficient use of the photographs and equipment that we currently have in the District.

Course should be 1 to 2 days max. Multi-resource topics should be covered.

1. 1 day to 1-1/2 days
2. Multi disciplines
3. Practical use of products
4. No

Course length - 3 days
  1st day - General aerial photography, and photo interpretation.
  2nd day - Specific tools available at the local office, i.e., B&W, Nat. Color, Color IR and etc.
  3rd day - Break the group into specialties and cover detailed examples. Maybe a short local field trip.

ESO

3 to 5 days.
Should be tailored to fit any of the needs in the area presented.

OCS

3-5 days oceanography
near shore sedimentation
coastal wetlands and habitats
fish concentrations
sea-state
bottom topography
pollution tracking and monitoring
thermal detection

[Possible/Proposed Course: Introductory course at District or State Office.]

(for all) Please explain why you think this new course should be added -- what advantages would be gained?

ALASKA

1) better communication
2) more manageable group
3) similar interests-easier to present materials

Broaden exposure to a wider range of employees and focus on local region applications and concerns.

ARIZONA

Closer to District employees, less travel costs. More potential for training to be related to day job functions. Build stronger state office - district relationship.

CALIFORNIA

A course at the district level could more relate to district disciplines, and resources. Would also decrease travel costs.

Greater exposure for all disciplines. Save travel funds. Course more specific to our needs.

- save on travel
- local imagery and ground familiarity will enhance the learning process
- more people could participate

If this course can provide the knowledge to complete a job cheaper or more cost effective then we should proceed.

Cost saveings.

This course may be helpful in finding ways to do various tasks which would be benefical to the District.

Improve efficiency of staff (get more done with less staff).

COLORADO

In many years we have a rapid personnel turnover (we lose trained people). It would be an effective way of getting people trained with a minimum of travel expense. If conducted at the district level, it could also be timed to take advantage of education opportunity for summer seasonal employees. More people would be sent to local training.

?

Use local areas for field work; also how the various techniques fit the local situation. Stress local sources of information, data, and expertise.

I would prefer the status quo. The advantage might be saving travel money.

Advantages are primarily the distribution of information relating to aerial photography. Remote sensing is not often used to its maximum potential in the BLM - primarily because of lack of knowledge and experience.

IDAHO

Advantages: More people would get the training. Travel costs are significantly reduced. Specific applications - problems can be addressed.

A course of this type could provide low-cost trainig in the applications of remote sensing. More people could attend, resulting in higher work efficiency.

Numerous, drive home the availability and uses of imagery to district personnel, cost ($) savings, advantages in enabling so many district personnel to receive training.

A larger audience could be gained at less cost.

There would be much less travel funds used, and more people could be trained at one location than if you were to send maybe 1 per year to some distant location.

Give more people in District an opportunity to attend. Less expensive in todays tight budget.

Course should be held within state. Employees need initial training or refresher.

IDAHO (Cont.)

Cover most field employees and acquaint employees with current knowledge of remote sensing and its capabilities and limitations.

MONTANA

Very USEFUL in resource mgmt and can be tied to computer for real time analysis and input for decisions and options.

A course that is state or district oriented has a better chance of meaningful representation and can discuss real, on-the-ground problems. I feel its the only way to go for basic training.

Basic training can be handled by the SO as an overview to remote sensing. Advanced training needs to be done under expert supervision and where facilities can give "hands-on" training.
Travel costs

Not a new course - merely holding training in a more cost effective way.

NEVADA

Saves travel, more locally relevant.

A larger number of individuals would benefit while keeping travel costs low. Most of our personnel would at least be introduced to remote sensing and its applicability.

Increased awareness of existing technology and realistic applications to improve management decisions.

Many more people could attend if given at field level. There is probably one heck of a lot of usuable knowledge to be gained from Landstat (digital imagery if one knew how to reap it.

To inform of present or developing opportunities for use. Low cost.

If supplemented by videotape showing examples of LANDSAT analyses and ground conditions together. This would be an excellent use of limited budgeting.

NEW MEXICO

More oriented toward on the ground problems and solutions.

Increase usability of existing products.

Increased awareness of potential for using remote sunsing. Right now, relatively few people understand what is involved or what capabilities exist.

If held in a district office, you would probably get 10-15 students on the first round. DSC should have an instructor role to explain Bureau capability.

==

OREGON

Travel restrictions prohibit sending more than 1 or 2 people per year under the best of circumstances. This is not enough to have an impact on the District as a whole. A workshop type approach to assess the Districts needs as a whole and to involve a large cross section of employees would help us to establish procedures as a group and bring the entire District up to date.

The primary advantages would be to train CRM specialists in new techniques and to inform them of applications that aerial photography has in CRM management.

The course should be a substitute for 9180-8, not added. More people could be aware of remote sensing uses/less cost.

Practical applications taught could be site specific. Learning where your work is practical.

More trainees will be able to attend course, because of the decrease in travel cost. A better "home" geographic area oriented course may be presented.

==

UTAH

Many students do not take any form of aerial photo interpretation classes in college. The Bureau must fill this resource management need.

This be a substitute for 9180-8.

UTAH (Cont.)

I think such a course should be added only to the extent that the states come forward in requesting. However, having a course locally is potentially less expensive and could be more revelant to the participants work.

To add additional insight and knowledge while working with local familiar area.

==

WYOMING

Only should be added if we would save money and still have a good quality training course. I imagine we'll be limited by the number of states without good training areas for a field trip.

Available remote data would be more usable to staff members.

Lower cost, more direct D.O. benefit, related to real world remote sensing use.

More people could attend.

==

ESO

East district or office has different needs that could be addressed. The course should be taylored to meet those needs.

==

OCS

It should be added because OCS programs do not allow their remote sensing scientists to participate in upland oriented courses.

==

Question #5: Possible/Proposed Course: Intermediate-level, discipline-specific.

This course could be conducted for a single purpose (such as to train a summer field crew) or for multiple purposes within a discipline (such as inventory, sale layout, and trespass applications within forestry). It could be held either at a central location or at a State or District Office, depending on projected attendance. It could be scheduled as part of a workshop (e.g., range workshop), or immediately before or after such a function, in order to take advantage of the group already being assembled.

(for managers) Would your District or State support this type of course? How many students would be sent (by specialty)? Would you have enough students to hold the course locally? What degree of involvement - if any - do you envision for DSC?

ALASKA

The demand and acceptance of this course is dependent on course 9180-8. 9180-8 should be a pre-requisite to a special interest course. This allows the majority of the time (75%) to be used to directly center on the "special interest" problems and applications--the real guts of such a course and not a rehash of 9180-8.

Yes. 3-4 Range/Landcover; 5-8 Lands. If statewide, yes. Limited.

If local, I would try to send 8 to 10 people over a period of 2 to 3 sessions.

==

ARIZONA

We would be very interested in combining remote sensing training with discipline specific workshops. This provides multiple benefits for specific workshops and provides the best opportunity for the subject matter to be directly applicable to dail work assignments. This would be pertinent to range, wildlife, soils and/or watershed, geologist, engineers, and fire personnel. These workshops range from 10 to 30 participants. Remote sensing could be from 1/2 to 1 day with from 1 or 2 instructors from DSC. All mentioned courses would be held locally.

==

CALIFORNIA

It would be difficult to conduct a single purpose training in Redding. It is much more cost effective to make it multidiscipline.
To conduct it as part of scheduled workshop may not be effective because the training may miss the target group--the people on the ground.

1) Each discipline would differ in #'s of students. At least ten resource specialists would be involved but I believe many more students would participate if cost effective.
2) In some disciplines, maybe--plants, range, and wildlife could easily be put together for one course--if it's in the fall not in the field season!
3) Involve DSC only if local assistance is not available.

Depending on which discipline, some courses could better be handled at the State Office level. In major disciplines, like range in Susanville, course could be handled at district level. Range: 10-15; wildlife: 3-5; fire: 2; archaeology: 2; forestry: 3. Probably only in range would there be enough students to hold course locally. DSC should assist in setting up course and give course.

Districts could better answer this.

We would support this training at the District level; about 5 students for each specialty. We would expect a large degree of involvement from DSC.

No. One or two students per year max. Need knowledgeable, experienced instructor--from State, USFS or DSC.

This would depend on the "singe purpose." If a district was preparing to do range inventories and remote sensing was a key to completion, yes--to all.

No comments.

==

COLORADO

No

This type of training might receive very little support. Discipline specific training is usually handled by the field supervisor as a routine necessity during the orientation of the employee. We envision not sending many to this type of training and probably would not have enough students to warrant a course locally either.

Essentially all resource specialists in the Canon City District have had the introductory course or its equivalent. Future training needs would be an intermediate-level, discipline-specific course.

In our own case, the basic course is ideal for our employees starting work in photogrammetry. A more specialized course would probably not be beneficial with this in mind. Possibly 1 or 2 persons from this office might attend a specialized course (depending on discipline) in order to provide consultation to those in Resources, etc., not so well trained in the area of remote sensing.

A two-day workshop was presented to approximately 32 resource specialists at Glenwood Springs R.A. and it was very beneficial to them. Photo interpretation and map interpretation were stressed. I feel a course along this line could be beneficial to Resource Specialists at both the District and R.A's.

COLORADO (Cont.)

Yes. Only one to three students would attend most appropriately in conjunction with a workshop. DSC should provide the training.

We would support this especially for planning teams or EIS teams as the needs arise. Scheduling would be somewhat erratic as the situations occur.

One to two days if held. The topics held should cover the most important aspects of whatever discipline is being presented.

IDAHO

1- Course designed to assist in Ag trespass abatement.
2- Course designed to assist in project layouts via aerial photos (determine percent slope, initial fence and pipeline layout, land treatments, etc.).
3- DSC should work with State Office in putting on this course.
4- Should be held in the field with 2 or 3 close districts attending.

This course could be held in conjunction with the introductory course or later as a follow up.
It would depend upon how many people you could truly handle in such a course. We could have anywhere from 5 to 15 people that could be involved in forestry.
DSC would be fully involved by providing the expertise to teach the course.

Yes. Range, 5 to 6; Forestry, 2; Wildlife, 3-4; Geology, 2.

Probably not, but maybe; 3 Foresters, 9 Range Conservationists, 2 Watershed; 2 Biologists; 2 Archaeologists; 2 Geologists; 3 Area Managers and 4 Engineers. If more than one discipline covered in the sessions, yes. If only one discipline, only range (9); Coordination, supervision training.

Estimate - 4 attendees in Range ⎤ If held
4 attendees in Wildlife ⎦ in Boise
DSC should be involved in setting up and conducting initial course and future involvement would depend as ability of State Office and Districts to conduct course.

The Digital Image Analysis course was great. But further computer related training is needed for those who have had the intro course--the D.I.A. course. These people need some additional general computer background, computer programming type work and terminal users courses. Also some training on using our facilities in conjunction with Remote Sensing in Denver to make our set-up more versatile.

Can't predict what program will be next year--next month--next? Concept is good. Special purpose training is needed--such as color IR for fisheries. Let's take a look at video technique.

We would have partial support for a course of this type. Approximately three students could be sent each year, one each from range, wildlife and recreation. These numbers would probably not justify holding a course locally. DSC may be involved to the extent of supplying or assisting in locating an instructor such as someone from the EROS Data Center.

==

MONTANA

An S.O.-DSC mix is needed I feel.

No. Limited travel funds do not allow sending onboard professionals to 1-2 week training sessions, much less summer temps. Only students already trained in API/remote sensing should be hired for such projects. Only District/RA level orientation should be required to accomplish AWP commitments using student field crews. I see no involvement for DSC provided field crews are under the supervision of someone adequately trained in API/remote sensing, i.e., someone with more than basic training.

This should be done by S.O. personnel as identified by districts.

Yes. Range, 4-6; Soils, 2-4. If the course were to be held locally more students would attend. There is no question that the best manner to get this needed training is to offer it locally. In every instance many more individuals could take advantage of it.

We could only be a sporatic supporter of a single purpose course because our needs (summer field crews, special projects) do not necessarily occur year after year.

The discipline oriented training would be excellent and has been requested previously. Budgets would probably force us to combine several disciplines (range/forestry, etc.). It probably will be easier to all if it is offered at a district office and personnel from that state and nearby locations are the primary attendees.

==

NEVADA

Not presently.

We would be supportive of this approach but could not host this sort of training locally as we would only send 2-4 students.
This training refresher format could be easily incorporated into a variety of Bureau training sessions and workshops.

This could possibly be used at State level in conjunction with winter discipline workshops. We have no knowledge of possible details.

Elko District would support this type of course if it could be conducted as described below. Two to five people from this District would probably attend depending on which resource discipline is involved. We would probably not have enough students to hold the course locally with one possible exception being some sort of range type training.

Yes, but not enough to hold locally, without other District participation. DSC instructors would be an asset.

NEW MEXICO

range - 4 >
wildlife-3 >
forester -2 > if at district
watershed types - 3 >
lands - 3 >

A round of the introductory courses first would help determine answers to the above. If R.S. were to be used, then training would be necessary. Potential attendance would probably dictate a central location.

Overall probably the best way to provide technical informaiton to the field on this subject would be to incorporate short (1/2 day) sessions on resource specific sensing applications with various program workshops held either at the state or district level.

OREGON

State Office course with 12-15 students. Course would be discipline specific, i.e., applications of remote sensing to forest and rangeland inventory. Course would be conducted by DSC with State Office taking over in near future.

No.

Only for a specific project. All involved in a project. Probably. Some.

Involvement in a course such as this would depend upon the utility envisioned from earlier attendees report. Perhaps those states or districts previously involved could be a part of the course to demonstrate the utility.

District would support this type of course.
Forestery - 2 or 3, Range 2 or 3. Not enough students for local course.
DSC involvement - training material and support.

==

UTAH

1. Yes
2. Approximately 10 students per year if held in district for about 1-1/2 to 2 days.

Perhaps? Our state would support such a course depending on our inventory/field work requirements for a given FY. However, the current trend is less emphasis on such activity.

Yes, if tied to the Introductory course.

See no need for this course if district personnel trained.

==

WYOMING

District would support the course.
  1 Forester every 2 years
  2 Range Cons per year
  1 Archeologist every 2 years
  1 Soil Scientist every 2 years
  1 Surface protection every 2 years
DSC should provide instructors and materials.

I don't see why numbers 1 and 2 above [introductory course and intermediate level, discipline-specific course] could not be combined into one course. I think that this course should be conducted at the State level. It should be taught by state personnel and others who have traditionally taught the course.

We would support this type of training. It should be conducted along with activity workshops at the State level. The number of students would vary by activity. For example, we have 13 Range Conservationists, 6 Wildlife Biologists, and 2 Soil Scientists. We would not have enough students to hold the course locally. Again the involvement of DSC should be in providing expertise and instructors.

1. Yes
2. 7 - one for each activity
3. No
4. They would run the show

Might possibly be held at State level. Could change locations yearly like current introductory course. DSC should have the lead, but should use active field personnel for instruction.

Centralized special topic course should be held (maybe not annually) for specialized users, i.e., soil scientists, range cons., wildlife, reality, appraisal, compliance (surface protection) and etc.

==

ESO

No need for this type of course. Much of this type of information could be incorporated into other intermediate training sessions (e.g., lands, minerals and range intermediate courses at Phoenix Training Center).

Other than for Cadestral Server crews there would be no point for ESO.

==

OCS

Yes, we would support such a program. It would have to specify our needs; i.e., concentrate on the coastal areas fringing one of our lease sales. We could foresee the attendance of up to 15 people from the OCS Office. If the DSC has an expert in coastal processes, their participation would be of great benefit. The course should be at least 4 days long (or 5). Topics included should relate to coastal processes and cover: area ice dynamics, coastal sediment movement, geology, topography, land cover, and human settlement. The aforementioned topics should be subject to a digital manipulation process to highlight informational points.

The courses you have listed look quite useful for "upland" oriented programs. Unfortunately, they will serve little purpose on the OCS.
This is regrettable, since multi-spectral remote sensing imagery is becoming more and more applicable to this program and training of OCS personnel would prove useful. You may therefore wish to consider a course centering on the OCS.
A curriculum could include:
1) Photogrammetric Applications - (i.e., coastal mapping)
2) Coastal Morphology
    a. Spectra (photo, IR, radar)
    b. Systems (seasat, landsat, U-2, etc.)
    c. Disciplines (geology, meteorology, hydrology, vegetation studies)
    d. Applications: (1) pipeline landfall
        (2) infrastructure site studies
            (a) oil and gas
            (b) hard minerals
3) Oceanography
    a. Seasat Interpretation
    b. Goes -3 Radar Data
4) "End-user" Techniques for Various Remote Sensing Data Banks
    a. USGS
    b. DIA

Thank you for the opportunity to comment. We will be glad to offer any futher suggestions or assistance, and these can be garnered by calling Walter Jones (FTS 8 264-2401) of this office.

Would probably be a very worthwhile course type for myself, however would be of little use to other OCS staff members because their involvement in remote sensing is very limited. A basic course will do for most OCS staff members.

[Possible/Proposed Course: Intermediate-level, discipline-specific.]

(for all) How long should the course be? Specifically what topics should be covered? Any other suggestions?

ALASKA

2-3 days
Topics dependent on group.

Length, topics would have to be tailored to task at hand. Probable 2-3 days with emphasis on R.S. basics and specific application.

2 to 3 day

Desired more specific's on right-of-way location based in aerial photos topo's etc., and identification and location of existing trails, etc., based on aerial photos.

==

ARIZONA

Course length is dependent on discipline and number of participants. Subject matter would be a modified version of 9180-8 and 9180-13. Modification of the courses would depend on for whom and why?

==

CALIFORNIA

Resource specialists should be aware of what is available within the District and how to obtain it. Explain the various uses possible with remote sensing imagery. Work on specific issues and ways to solve these issues with various imagery.

No specific needs at present.

Districts could better answer this.

Depends on objectives.

1 week--3 days discussion and exercise and 1-2 in the field--actually using photos, maps, etc.

Course would probably best be handled as a scheduled part of a discipline workshop. One to two days should cover most disciplines. Main topics of concern would be measuring and interpretation of vegetative production and change and mapping of vegetative types. Specific elements would be identified by disciplines.

The topics vary greatly with the discipline, i.e., the level or height is critical to Biologist who need low-level photos for vegetation analysis and Landsat/high level for drainage analysis, etc.

==

COLORADO

One to two days. Soils typing, timber typing and species identification.

A course should be developed for engineering applicaitons, to include:
1. Aerial surveying (when best used and costs, time).
2. Necessary field work to compliment aerial surveying (control panels, ...)
3. Expected accuracies (good enough for easement plats?).
4. Mapping applications (especially roads, reservoirs, . . .)
5. Photogrammetry (general)

One or two days maximum, concentrating on applications pertinent to the resource specialty. Specifically, "hands on" applications of the newer, more advanced remote sensing techniques.

2-3 days
The course could be tailored to the specific subject, i.e., R/W route, hydrologic, forest plan, etc.

==

IDAHO

- Color IR for special projects
- Video capability and techniques

Whatever it takes to cover the subject. Could be held in conjunction with a workshop.

As long as it takes to get the topic across to the students.
Topic to be covered - Where and how can coverage be obtained to show what the progressive changes are to the district. How often can these be obtained. Where can we get the money to do all of this?

2-3 days
photo measurement
vegetation interpretation

3 days estimate

2-3 days; all different resource disciplines; emphasis on interpretation and mapping; procedures on photo imagery acquisition, setting up a photo mission; acquisition of photo enlargements, applications of saving time, energy and money in field work; need for budgeting $ for photo needs $ requirements.

Two to three days should be adequate for the course. This may be an appropriate course in which to discuss some of the considerations for acquiring aerial photographs such as crab limits, color variations, etc. Another topic would be the use of remote sensing for rangeland monitoring. A discussion of the results of using low-level aerial photography for monitoring purposes would be very useful.

Schedule as part of a workshop. Incorporating discipline-specific topics with other workshops is an excellent way to interject remote sensing. Example, we are having a 4-hour discussion of the use of a low altitude aerial photo technique for "monitoring" at an upcoming fisheries-wildlife-range monitoring workshop.

==

MONTANA

≤ 1 week
Use of local, site specific, data with transfer by remote sensing to larger areas in the district.
Give the program a "local" influence by having participants bring problems from their areas.

Orientation to projects should not exceed one week, covering goals, objectives, and methods of project.
Other suggestion - Forget training for students when on board professionals don't even get adequate training. Hire only QUALIFIED summer temps.

Very short course pertaining to the specific topic that the special crew was hired to investigate.

2-3 days is appropriate.
Topics: Establishing control, inventory and monitoring applications, project design aspects, establishing a photo record.

==

NEVADA

3 days
Range/forestry, inventory, mapping, productivity estimates based on 2-season comparison by species. Other training not required.

Perhaps a one-day session, specifically covering opportunities for a given discipline, could be presented where specialists in a specific discipline are already convened for other purposes. In Nevada, for example, fisheries and wildlife biologist convene annually for a program review, as do hydrologists or watershed specialists. A one-day session including some presentation plus opportunity for questions and discussions might be very helpful.

3 days. Practical application of remote sensing techniques to the discipline concerned. use of remote sensing in trespass would be helpful.

Light of course--cut to actual useable knowledge that a field range conservationist needs and can effectively make use of in the field. Topics to be covered would be only those that are germane to the program (range-forestry, etc.). If other field are covered it should be very lightly, just enough to make us aware of it application or importance.

1-2 days
- Trespass identification.
- Range condition and trend identification and analysis.
- Project layout and design.

==

NEW MEXICO

As part of workshop about 1/2 day is suggested.

3 days or less

What is necessary to plan, develop and carry out a project. Length would be determined by material to be covered.

==

OREGON

Course length should be 3 full days. Once again, topics should be very practical with easily seen field application. Student should be aware of the way each subject taught can help him get the job done on the ground.

Not at this time. Possibly after an introductory session had been held and the Districts needs evaluated.

2-3 days
How to use remote sensing on the project.
This is probably really needed in AMP monitoring--can it be monitored this way? Has it worked, is it working elsewhere?

Three days would be long enough. Applications that aerial photography has in CRM managment. In addition, more advanced techniques and information from the Chaco Canyon project could be included.

Course length - 1 or 2 days.
Hands-on training in specialty: timber inventory, SVIM, etc.

===

UTAH

Could vary greatly depending on specific requirement.

1. 1-1/2 days to 2 days.
2. Detailed mapping and vegetation interpretation, including erosion measurements.

This course should probably be tied into the introductory course. 1-2 days would be spent on the Introductory course and then a day on the intermediate course. The agenda would have to be carefully scrutinized to cover only essential items with practical application.

3-5 days in length
Land surface inventory and identification.

===

2 to 3 days. Cover subjects specific to the resource for which the course is being offered.

Course length should be limited to 1 day.

N/A. This could be conducted at the District level also - seems to overlap with #1 proposed course.

5 days.
Soils - Range - Compliance (Surface Protection)
Fire Management - Geology (exists)
Reality and Apprisial - Wildlife - Cultural (archeology)

1. 1-1/2 to 2-1/2 days
2. Could be any action or activity which involves resource management.

Question #6: Possible/Proposed Courses: Courses for managers.

Managers are seldom able to devote an entire week to remote sensing training, and in many cases they would have difficulty attending even a 2-3 day session. Possibly a half-day to full day session would be feasible.

This course could be offered in conjunction with other functions, such as a meeting of District Managers.

(for managers) Would your office support such a course? What specific topics would be covered (e.g., use of remote sensing to assist in RMP for a planning unit)? How long should the course be? Who would attend (what level of management)? Any other suggestions?

ALASKA

Not need at my level.

Yes, these courses 1/2-1 day have been offered locally with good success; most importantly examples of R.S. application in programs or demonstrations if successful application elsewhere; AMs, ADM, Branch Chiefs; none

One half-day is marginal as 2-3 hours seems to be max.
- Use no R.S. jargon. - Center on direct applications based on real world examples where management decisions were based on R.S. applications.
- Strongly emphasize cost (workmonths, dollars), accuracy (how good) an essential item, lead time to do analysis/accuracy, efficiency/savings, integration for interdisciplinary use.

ARIZONA

Generally, yes. One-half day. Program leaders, Area Managers, some DM's and District resource chiefs, some technical services, fire management, Branch Chief Engineering (10 to 20 people). Two hours of structure lecture for practical application management. Two hours of panel discussion for questions and answers which have been previously staffed out.

CALIFORNIA

DM's - AM's & Res. Chiefs.
1/2-3/4 day on state-of-the-art and cost effectiveness of approaches.
We can't get the funding to purchase new conventional photos. Let alone speculate on effectiveness of recent developments.

We would support such a course. Half-day orientation on uses of remote sensing data and latest information in Landsat Digital data and Geographic Information systems.

One day maximum.
Management team (S.O., ASD, Div. Chiefs, D.M.).
I think a course like this is badly needed!!

A short introduction could be given to AMs, DMs and Chiefs at SO meetings relating new aspects of remote sensing and its application to resource needs and problems.

Course should be supported - brought to District locations - one day.

Course is necessary for many managers to demonstrate to them the usefulness and value of the remote sensing tools that are available. It probably should be confined to 1 day or less.

Yes - we would support. Benefits - pay-offs, time savings techniques these need to be shown before you'll get mgt. support - 1/2 day max. DM's - ST. Off. Div. Ch.

1) Yes
2) The benefits of remote sensing not the "how to." They need to appreciate the tool so that they can understand the financial requests made by Resources Staff specialists.
3) 1 day
4) Div. Chief of Res. and Management (DM and AM)

==

COLORADO

With most managers having worked in the field offices through their careers, most are experienced with the use and application of remote sensing. If held, this type of course should be short and cover only the most recent developments.

An "update of the art" relatively general presentation could be given at the management courses at the Phoenix school.

Probably not needed. No.

Specific mini-courses for managers would have some advantage, especially in informing them of possible Remote Sensing solutions to their particular problems.

Yes. Basic application to ongoing programs and range management, planning, EA's, EIS's, etc.
One day session should be sufficient.

==

IDAHO

Attended by DMs, S.O. Res Staff, Ch. Div. Res. and AM's in D.O.s.
- Imagery interpreted by computer
- Vidio techniques and capability

- Have already had one, put on very successfully by Doug Harrison of Idaho State Office.
- Multiple resource applications
- photo acquisition
- how to fly a mission
- interpretation and mapping
- availability of training (video)
- budget requirements
- interpretation and mapping
- 1 day (6 hours)
- all resource employees, area personnel, area managers

I am not a manager, however I will comment on this because I'm faced with "selling" useful remote sensing techniques to managers.
Two issues usually surface when managers sit through a technical remote sensing session, I have found.

1) "As a manager, convice me that remote sensing will streamline my program. Show me evidence."
2) "Remote sensing will never substitute for actual on-ground studies; what are the sacrifices in quality control when remote sensing is applied. Remote sensing adds costs to my programs."

Perhaps what is needed is a training approach for managers covering such topics as:

1) Cost-benefit studies and remote sensing
2) Roll of remote sensing in programs subject to funding and personnel losses.
3) Quality control achievements using remote sensing.
4) Planning and coordinating remote sensing projects.

If we can't sell remote sensing to the managers, we'll never develop a viable, useful, cost-saving program.

A videotape course might be the way to go; then when they have the time they can get into it.

This office may send one person to such a course. Interest was expressed in an informational rather than a technical format. Some suggested topics are the use of remote sensing for rangeland monitoring and the economics of some current remote sensing techniques.
To allow maximum attendance, the course should be less than two days in length.
An Area Manager would be attending the course.
Another suggestion is to develop some type of system for distributing remote sensing information to managers. A slide/cassette tape series, an information bulletin or perahps a short video tape directed toward managers could accomplish the same objectives at lower costs and with higher "attendance."

1) Yes
2) Yes
3) 1/2 - 1 day
4) Division Chiefs, ADM
5) No

We would support a course for Area Managers, Assistant DM & DM.
Length - 1/2 day
Topics - Use of remote sensing inventory and planning

More managers and supervisory personnel need at least a short overview course dealing with remote sensing to bring to their attention the possibilities that can be developed from currently and developing technology. Much of our staff is at least aware of some of these, however, follow-up and use of this technology is a low priority with managers especially during budget problem times. However, much of this technology can save time and money if an emphasis is placed on it. This can only be done if managers are brought up-to-date and remain current to some extent on this technology.
A 2-3 day course would be of minimum impact upon managers schedule. All AM's should attend, DM if possible.

MONTANA

I can't say how S.O. management feels about this. If a training proposal was developed, we could get an idea and sound them out a little.
I feel that the idea is a good one and would be willing to assist.

Our managers have no need for detailed photo interpretation capabilities. They can be briefed on methodologies by the specialists involved.

A short course for managers is really needed but your chances of getting one on the schedule are not good. Perhaps it could be offered in conjunction with another short course or get together.

Yes. Managers should understand the state-of-the-art, limitations and utility of remote sensing. Leave detailed nuts and bolts application to technicians.
Two-day course should be ample - line managers, including D.M.; and ADM's, and Resource Chiefs should attend.
High altitude and satellite imagery should be covered.

A videotape presentation would be much better. Show some examples of how remote sensing is being applied, costs, etc.

A qualified expert in the State Office or District Office could BRIEF managers on the operational aspects of remote sensing. I doubt that managers have a need to know (other than personal interest) the properties of radiation, choice of films/filters, spectral response, development of photomorphic keys, etc. They do need to know what remote sensing can do and the end products that can be obtained, which can be presented by trained field professionals or a remote sensing coordinator.

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NEVADA

Yes. One day. DM's, ADM's, Chief Resources. Overview of new, but practical applications.

If held in the District, we would probably have five to eight managers and supervisors attend. If held in the State Office, just one or two would likely be present from Elko. A general course on the state-of-the-art and its applicability would be most beneficial and should not exceed one day--shorter if possible. In this District, attendees would be the DM, Area Managers, Division Chiefs, and possibly supervisory personnel within the resource areas.

This would be of value. Best topics would be use of remote sensing in current inventory and monitoring efforts (range, wildlife, wilderness, geology, etc.).

OK. 1/2 day.

Managers also are not aware of possible time saving real applications of remote sensing to BLM jobs.

The 1/2 day format is most applicable to management and should stress how remote sensing and digital analysis can improve management decisions and be an economical and efficient way to deal with decreased budgets. This should be an overview of current projects and should not address the nuts-and-bolts of how it is applied on the ground. It should be stressed as a management tool!!

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NEW MEXICO

Why should District Managers develop new technical skills when 75% of the time is spent on user meetings, personnel and other administrative chores. Area managers probably have even less time.

Yes. Managers should be aware of general aspects . . . figuring costs output products, etc.

We have used this approach in NM. A half-day session explaining remote sensing capabilities and showing examples of work done and associated costs help raise management awareness of remote sensing as a tool. Don't get into technical details. Show a typical project plan, schedule and products.

==

OREGON

District would support course if at area manager level, but it also could be attended by District Manager's staff, such as planning coordinator.

State Office course for 1 day which would offer a broad overview of remote sensing techniques and methods but would deal mainly with sources of practical application expertise, i.e., who to go to for what and when. Would be nice to know what publications a manager might need in support of such an effort.

No.

Since much of our planning effort and related inventory effort is winding down for the next year or two we would not anticipate a pressing need for this.

==

UTAH

Support this course. SD, ASD, DM's, S.O. Div. Chiefs & Branch Chiefs. Course needs to tell manager what remote sensing can do for the manager, how it can help in management decisions, and what is available now and planned for future. Probably need a 1-2 hour presentation on what remote sensing is and indicate its capabilities. Total course to be 1 day in length.

Looks like limited utility at the field level.

I personally would support such a course, however it is difficult to get management to sit down for even a half day. Ideally all DM's/AM's and Division Chiefs could attend. Anything less than a 1/2 day session would probably not be long enough. Emphasize the importance of sound mapping procedures. Capabilities of remote sensing, the analytical capabilities of a GIS.

Focus on the first problem--to get management "up to spend." Start with a course making heavy use of a manager who has been "sold." Use his management knowledge combined with how remote sensing can solve management problems (build credibility).

Even if a management course can't be developed or presented -- some effort should be made to make managers -- at least down to the DM level aware of what can be done with R.S./GIS technology. Perhaps the only alternative to a course is to have brief presentations whenever more than 3 DM's flock together -- but some effort should be made. Most DM's are very skeptical of "Remote Sensing" especially via Landsat. But much of their negativism could be overcome if they were aware of some of your more recent projects where RS technology is incorportated with ancillary data and a GIS type system results.

WYOMING

Should be an orientation course on the "State of the Art" available to BLM attended by DM's and AM's in conjunction with another function.

The managers should be able to pick up enough info from their specialists who have attended remote sensing training so that a short course is not necessary.

We would not support a remote sensing course specifically for managers. It would be much better to devote 1/2 day to management type applications for remote sensing in the introductory course if it was held at the District level where all local managers could attend.

District would support course if the following points are met.

1. Topics should show benefits gained thru remote data use.
2. Course time should be 2 hours max.

1. No
2. Policy and resource development actions
3. Not over 1/2 day
4. Managers
5. No

Yes, but also include programming/funding aspects.
We have held these in the past (no recently) with SSD staff presentations.

ESO

Yes, if this course were held in conjunction with another meeting or workshop.

Topics: Use in planning, unauthorized use detection.
Length: 1/2 - 1 day is enough.
People: Program managers in Washington Offices, State Office Division and Branch Chiefs, District Managers and Area Managers.

==

OCS

This course would be useful; however, it would be difficult to justify an out-of-state trip for a one-day course. Perhaps a general meeting for all OCS managers and division chiefs could be arranged. Course length should be at least 2 days if not longer.

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Question #7: Independent (self-study) courses.

Another possibility which has been explored only superficially is the use of instructional materials for independent study. Purdue University has produced a Mini-series on Remote Sensing, consisting of 25 slide/cassette tape exercises covering many aspects of remote sensing. The BRS and the DSC Learning Center have copies of these exercises.

There are a number of discipline-specific workshop exercises developed at the EROS Data Center. Most of these consist of imagery (Landsat and conventional photography), overlays, and exercises. Excellent materials are also available elsewhere.

(for all) What are your recommendations along this line? Should a library-type system be used to lend out materials from a central location, and/or should materials be obtained locally? Should videotapes be considered? Do the Districts and States have access to this equipment? Any other recommendations?

ALASKA

- Central loan out facility
- Probably should be drawn on by SO Remote Sensing Coordinators who should give direction to interested personnel--otherwise a dismal failure
- Meets with marginal success
- Best serves as a tickler to more formal courses

Purdue U course is terrible but many have found it useful. Self help courses are useful; State or Regional library type system sounds good especially if flicks are available explaining available course; yes, yes.

This appears to be a workable alternative given the realities of funding, etc. Should have a central location, so that material can be kept current with minimum expense.

ARIZONA

Yes, videotapes should be used because each district office has the necessary backup equipment required. The districts do have access to slide/cassette tapes through the state office. Considering our present budgetary constraints this may be our best viable option. Most of the slide/cassette tape exercises provide easy to understand well organized programs. Some need to be updated. Most of these exercises need to be taken independently and not as a group. If a short narrative could be developed for each slide/cassette tape exercise this could be sent more effectively to the Districts for review and selection. If demand is high, Arizona will request purchasing some. DSC should be responsible for program and training updating.
Current reference lists with available reprints would also benefit the districts, very cost effective.

Perhaps a videotaped presentation is available or could be made which would fill this need.

CALIFORNIA

Yes on all items! Slide/tape is least expensive and all Districts and Areas are presently equipped to use. Video is nice but much more expensive.

The District does not have videotape equipment. For introductory training, this concept may be ok but for skill development, I do not believe it would be effective.

This is fine but you'll never get the message across to those who should have the tng this way.

It's a great idea but in reality it is almost impossible to set aside the needed time, because if you are in the office there always is some need or pressure put on your time. The field work is an essential step with the courses and could not be met by self-study programs.
Perhaps a brief but good intro to Remote Sensing (not a hands-on, how-to) course could be developed for all libraries and then students could attend specific training (ie., wildlife, hydrology, course that teach skills).

Videotape would be excellent but each location needs their own copy so students can view portions as time permits. If you have to order it, it won't be used because people have a difficult time scheduling time for self-taught training without having to order materials and waiting.

Seems like a good idea to have materials that could be loan out through our library.

This type of material could best be used as an alternative when courses could not be offered or as a refresher. Videotape equipment is available on the Susanville District.
This should not be used to replace organized training sessions as discussed in this questionnaire.

COLORADO

This should definitely be pursued. I recommend:

1. A compilation and distribution to District personnel of all available materials (including abstracts of most useful texts and courses).
2. Aquiring some of this material at the DSC and State level, and publicizing the availability of this material.
3. Videotapes would be useful (Grand Junction District has videotape capabilities).

The material should be available at least from each State Office. Videotapes shold be considered since most D.O.s have video equipment.

We have had considerable interest stimulated by this type of a program. Any kind of material available for check out of a library system should be considered. Most people would like to see a central system library set up. Videotapes should definitely be considered as the equipment is available.

Yes.

Lend out system: Slide/tape or videotape. Slide/tape would seem better because of the large screen capability. Most remote sensing items do not come across well on a small TV screen.

A centrally located source of this type of material would be sufficient for our use. Videotapes would not really be necessary for most courses we would be using.

This should be a cost-effective way to introduce staff to remote sensing. The more advanced resource specific courses need to be tailored to our AWP commitments and would benefit by a knowledgeable instructor. A library system would appear beneficial. Videotapes seem to be more useful for general information dissemination than technical instruction. Stereoscopes are about the only equipment commonly found in Districts and Resource Areas.

==

IDAHO

This is an excellent alternative. A full library should be developed at DSC or S.O. level, with a library covering the basics at the D.O. level. Videotapes should be considered.

The use of instructional materials for self-study is very useful. We have purchased 12 LARS mini-courses for BLM-Idaho and are on file at the ISO training material library. Districts interested may use them on a "check-out" basis. I favor a "central" location so that the "whereabouts" of each set is known and the scheduling of the courses is coordinated.
I would support the acquistion of videotapes as a training tool in as much as many Districts now have their own video systems. LARS of Purdue now offers videotapes on remote sensing, but at $200 a tape is a bit too much $ for a State or District to justify. Perhaps DSC-BRS could have a set on file for all western states' use.

Make these available on a trial basis, on a state-by-state basis. Videotapes would be fine, films ok too. I-4 has both types of equipment.

Considerable interest has been expressed in this type of approach. A set of materials could be acquired for each state or at DSC for less used or more expensive items and used on a loan-out basis.
Cost should be looked at carefully for videotapes. If training can be accomplished more economically with videotapes than with conventional classroom type training then they should be considered.
Training of this type could be accomplised without large travel expenses, a big advantage with continuing budget cuts.
This district has a video tape player for 3/4 inch cassettes.

We have videotape equipment. I question the value of videotape or self-study. It may be O.K. if formal training is not available.

I would think that much of this training course could be videotaped to reproduced for each State.

Think this has most potential--I would like info kept up to date--so probably be best on a loan basis for D.S.C. Prefer videotapes!

Each State should have the program for use within the State.

This sounds like it might be a good way to go. An individual could take their time and during off season could learn about remote sensing. How costly would it be for each location to obtain materials. If it is within reason maybe this would be the best way to go.
Yes. Videotapes should be considered. Most districts would have access to this equipment.

A library of materials should be set up from central location. DSC or State Office should prepare an information memo informing the districts what is available for self study, e.g., the Purdue University material.

==

MONTANA

Yes, we should be given the opportunity for these self-study courses to eliminate travel and training $$ constraints for those who are interested. Our current library system should be utilized, as most areas are remote or have poor local sources. Videotapes are valuable teaching tools for all phases of instruction, and many have access to this equipment.
The catalog of offered programs must be kept current!

Independent study could replace 9180-8 effectively, especially when combined with readings in professional journals. Slide/tapes and videotapes are good instructional tools and should be developed. Districts and RAs have this type equipment.
Other: Encourage use of EROS data center--especially workshops where "hands-on" experience can be gained.

In this day of tight travel budgets this may be a good way to go. I have attended a group independent study using the Purdue material. It was very good. Our district has videotape capability.

Very underutilized now. All Mt. offices have this equipment.

Very underutilized now. All Mt. offices have this equipment.

Montana districts do have machinery to view tape series such as this. I was not terribly impressed with most of the Purdue series. Some was good, some not. I'm not familiar with the EROS materials. I feel we should pursue this option. However, the classroom learning environment is still required in many cases. Both self-study and classroom settings are essential.

NEVADA

The Las Vegas District has video and slide equipment which could make the self-paced instruction type course very attractive. The training could be used as a refresher for all experienced personnel and as a preliminary exposure for all other staff. This form of training could be easily tailored to specific needs.

Perhaps a slide/cassette tape series or videotape series could provide some introductory exposure to interested individuals at a minimal expense. Nevada Districts have access to the audiovisual equipment necessary for viewing such materials.

Videotape or slide cassette materials are an excellent idea. This should definitely be explored. Our district, which is typical has access to this equipment. A lending library would be best. This would help in keeping the material updated.

This has possibilities in time of low budget. A videotape and a cassette/slide series would be useful in areas mentioned above.

See videotape format suggestions in foregoing items. You need to see action changes not a series of stills because to do the same job with stills would take too long.

These methods once material is developed and organized are a desirable low cost alternative to other training methods. They should be encouraged and made available.
Most Districts have the audio-visual (including videotape) equipment to make use of these materials. We just don't know what is available or how to obtain it.
Properly prepared applicable material prepared in a videotape program is the most desirable.

District has video playback capabilities; a central system (library type) versus local distribution would depend on the need (number of personnal interested) and the offices ability to meet those needs, costs, etc.
I personnally would like access to the tapes for personnal knowledge.
I like the idea of videotape training.

What DSC needs ABOVE ALL ELSE is a program of videotape training programs where a piece of the action could be expanded, explained and reviewed. This would allow a manager to expose nearly ALL personnel without eating into travel ceilings. That way a tape could be prepared with an instructor to explain the system, so that each district office could have a training session. We definitely need more "hands-on" demonstrations so that State personnel would have a chance to work in the problem and to understand what is actually available, in terms of data, in order to watch the changes which occur on the CRT at different channel inputs/ratios.

==

NEW MEXICO

Central--State or DSC
Yes. Videos, Yes, we have equipment.

This is a good possibility in those offices when learning centers are in place.

You need to give priority to
- half-day awareness sessions for managers
- general introductory courses than can be conducted in District Offices to raise general awareness of employees.

Once people know about capabilities, the ideas will start to flow.

==

OREGON

Build a library-type system with videotape as the core. We do have access to this equipment in most offices.
In Oregon we could have 1 district set up eastside and one westside to host this type of training.

The Burns District would make some use of self-study material on slide/tape medium. We presently do not have videotape equipment but may acquire this in the next year or so. We would then be very much interested in videotape course.

No. Not site specific enough for our area.

OREGON (Cont.)

These training materials should be evaluated by training staff. Materials should be loaned out library fashion until a large enough need is formed to distribute from a local area. Videotapes could be considered if video facilities are available (none at Spokane District).

The Purdue mini-series may be of value in getting a basic understanding of the potential for using remote sensing.

These materials would be useful immediately following a course.

==

UTAH

If not too costly could be worthwhile.

A possiblity, but need for training needs to be stimulated within the mgt. ranks.

Good proposal. Using this approach there is capability to respond to individual interest and need. This method would probably be most useful for general orientation and introductory type materials.
Technical type information would probably be presented more effectively in an organized session.
Videotapes available at the State level or even from SDC would probably be sufficient.

I'm generally cool to this approach. I don't feel the subject matter lends itself to such a course. Most Districts have equipment for slide/tape courses - some have videotape. If a course is available off shelf--at a nominal cost I suppose we should obtain it -- However I feel it would be a poor substitute to a classroom/field lab type course.

Yes! Materials should be obtained locally. Videotapes would be helpful.

Tape/slide or videotape would be very helpful for a review at the beginning of field season. Materials should last about 1/2 day of time.

==

WYOMING

This gives the most bang for the least buck. A library-type system would be excellent as long as materials could be sent to District and Area Offices. Our District Office has a videotape machine and its use is not a problem.

A library for lending out materials such as slide/cassette and videotapes would work well along with written material and exercise material to be kept by the person taking the course.
Materials should not be obtained locally.
Videotape and slide equipment is available.

I think this is an excellant idea. Equipment should not be a problem.

Seems like the info which would be presented for independent studies would already be contained in 9180-10 and 9180-13. Also, isn't this the job of the state's Remote Sensing Coordinators?

Videotapes should be considered. We do have videotape equipment in the office and are using it to view tapes from both the State Office and Service Center. This has been a valuable tool in helping train new employees.

More handbook/technical guides are needed. Could be used with slide examples. Slide/cassette tapes would have low usage.

1. Let States and Districts know about the series and order for use as needed.
2. Yes
3. Yes
4. Yes
5. No

==

ESO

This type of course need to be on the State Office level. That office then needs to take the lead in promoting the use of the courses.

A library-type system has possibility. Most District Offices and all State Offices have access to the necessary videotape equipment.

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BIFC

If these types of courses are available, can a composite list be made and distributed to all interested parties. Travel for training is becoming very scarce and independent (self-study) courses of this nature would be most useful.

==

OCS

This appears to be an excellent idea. We were not aware of the Purdue University mini-series. Would it be possible to obtain a list of topics covered by the Purdue series? As Alaska is some distance from conventional information points, we would urge the formulation of a remote sensing library at the BLM Alaska State Office or the USGS EROS field office. Videotape material should definitely be considered. Courses in remote sensing, even in the introductory phase, should be area specific to the attendee. For instance, a forester or geologist from California should not be instructed with images from Michigan. Remote sensing courses should also be specific to the job missions of the attendees. This aspect would facilitate both interest and the retention of knowledge. In short, to the greatest degree possible, training should be tailored to office mission, discipline, and geographical area of interest.

I would think that self-training would be beneficial, particularly of the Purdue series. We cannot obtain these materials locally. The training credit would be an incentive and worthwhile.

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Last question: Any other comments you might have with regard to remote sensing training would be greatly appreciated.

ALASKA

Arrange for 1-2 week temporary duty assignment to DSC Branch of Remote Sensing for advanced level personnel to upgrade skill proficiency in computer-aided analysis in light of new software and new data formats. This is long range if one considers the Bureauwide stituation. The only BLM personnel who currently would fit in this category are already in Denver or are in Alaska. These are the full-time remote sensing specialists, not the single project or sometimes interested person.

It's important to develop an appreciation of the capabilities of R.S. within on-the-ground operational staffs! Examples of successful application is an excellent way to do this. Emphasis should be increased on readily available data such as airphoto interp and acquisition of assistance for major project work.

CALIFORNIA

We sure need to get some of this moving ASAP as we are not using remote sensing to its full advantage!!!

The use and application of remote sensing will become more important in these times of austere budgets and tight travel.

COLORADO

The Branch of Remote Sensing has done a fine job with their training program. It has been sufficient for the needs of the Colorado State Office. Localized training would not be all that advantangeous to us, as DSC is close at hand. Your concern about patron response at each training session sems to keep your courses pertainent, current and very worthwhile.

None.

A lot of field personnel are losing or not getting the "state of the art" training needed due to lack of courses or tight travel funds. Any method of bringing the training to the student that can be divised would be a great help.

It has been suggested that the district have one specialist fully trained as to what is available and that individual could train or inform the rest of the district on what might be needed or useful to other specialists.

Most of the remote sensing training provided involves the use of equipment available in few BLM offices. Before extensive BLM application of remote sensing techniques can ever occur, sufficient equipment will have to be in place in field offices, including photography.

Most importantly, greater publication of both available imagery (especially other than BLM) and available references on applications would be very beneficial.
Of lesser importance are formal training courses, although courses at the district level would be worthwhile.
Also, more publicity of BLM capabilities relating to remote sensing (especially staffs experienced in remote sensing who may be contacted for assistance) should be achieved.

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IDAHO

Encourage more use of remote sensing material.

We need more!!
- accessability > All on a more
- availability > localized level.

However, any expansion of training must be looked at in the cold light of budget cutbacks. The comments we have made here are based upon past and present funding and staffing levels. If FY 83 and beyond brings even tighter budgets and staffing, our support estimates will be lower.

The Idaho Falls District feel that the four [types of courses suggested] are excellent, and follow-up made if possible.

This program could turn out to be the saving grace of land management in the 80's (and 90's!). A great deal of emphasis has to be placed on the value of remote sensing to the Bureau. In view of the quickly diminishing $ available for on the ground work, remote sensing is the only tool left that will enable land managers and decision makers to stay in tune with the resource they are responsible for.
- Need to present good examples from existing Bureau projects and program applications. Show the results!
- Need to have exposure within the Bureau.
- Good PR with the states out of DSC and services to the Districts is essential.
- Photo enlargement sources to the public out of BLM offices really helps a District's image. How to do it could be a DSC training role.

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MONTANA

Short 1 to 2 week training sessions are not enough to effectively utilize remote sensing techniques and products. A person should already have formal training in API as a starting point. Training should not be general but rather discipline specific with indepth training to effectively utilize remote sensing as a management tool. One definite restriction to the use of remote sensing as other than a glorified air photo is availability of equipment. LANDSAT MSS imagery is not effectively used without a color additive viewer to develop photomorphic keys and enhance objects/areas under investigation. Access to equipment is also limited by tight travel budgets. One suggestion is to establish remote sensing labs in the State Office and make the equipment available to specialist. Having all facilities in Denver or other Regional Training Centers doesn't lend accessibility to field offices.
We also need to develop cooperative training efforts with EROS and NASA to begin effective, long term commitments to the use of remote sensing as a management tool.

A newsletter of sorts to keep people aware of program advances and how other people (agencies, univiersities, etc.) are applying data and techniques.

We hope the responses facilitate efforts to improve existing courses and develop new courses.

We thank you for the opportunity to express our needs for effective resource management.

I feel that the basic photo courses that are offered 3 times per year, mostly in the southwest are not really meeting the Bureau's needs. Newer employees just out of school require some kind of a course like this if we expect them to use photos and other remote sensing technologies. Other than the forestry and geology schools, most of the resources applications schools aren't doing much of a job and if they do mention remote sensing at all, they dwell on Landsat and digital applications and don't even deal with aerial photo items.
Both of these facets of remote sensing are important and should be covered as equals.
Thanks for the chance to comment.

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NEVADA

Unless states and districts obtain the necessary equipment and are committed to implementing remote sensing technology the current level of training is of little use.
DSC should recommend and coordinate procurement of necessary equipment (e.g., zeis transfer scopes, magnifying stereoscope, digitizing tablet).
Computer applications should also be stressed.

Remote sensing training is fine IF this system was allowed to be implemented. Unfortunately, there seems to be a reluctance to employ this system in the manner it should be, thus saving a lot of $. Unless there is a commitment, on the part of management, to train, utilize and evaluate resource personnel work in remote sensing, then there is little to be gained by spending money to train an individual to do a job which is not given a high priority and further, who may leave--thus taking the knowledge of remote sensing applications away in his head.

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NEW MEXICO

Remote sensing data utility against the ADS/MOSS software should be built into your remote sensing training.

- Explanation of uses of the data, strengths and weaknesses.
- Status of bringing remote sensing technology and the ADS/MOSS software together where end-users can realize benefits.
- What benefits for end-users will be as a result of training and participation in use of the technology.
- Etc.,,,

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OREGON

We are open to proven or even possible utility, but until we are able to determine the value of, or applicability to our districts programs we could not commit any specific number of people to a given course or the professional types.

We see a need for training related to monitoring, especially for range, riparian. Apparently Montana is using remote sensing in their AMP monitoring program. If it is working, the entire Bureau should be made aware of it and if requested, trained in how to apply it to individual districts specific needs.
The bottom line is--we need training for specific projects (1) in how to use on a project and (2) on what projects might it be useful. This means that all training should assume a decent level of accomplishment in remote sensing by a beginning student.

If we were able to have one expert in the district to handle the program, it might be of value to us. At present, we do not see the need for such luxury.

Our basic tool for management planning has been relatively low elevation (1:12000) photography. Given the intensive level of management applied on our lands, we don't believe that LANDSAT imagery, etc., would be of much practical value for most activities.

OREGON (Cont.)

1. Oregon needs a full time remote sensing specialist in the State Office.
2. Each disrict should have one employee who is responsible for the program in his district (Inventory and /or Monitoring Coordinator).
3. Since Baker district has a project going now perhaps it could be the training district for the state with one being set up at a later date on the westside.
4. Keep training very practical and tie every phase to some aspect of getting the job done on the ground.
5. We need a short newsletter from DSC and State Office's talking about things that are going on in their area.
6. Spend time on site specific monitoring and other levels of remote sensing such as 35mm or 70mm aerial camera mounts.

UTAH

Get out of the so-called interesting photos taken from space vehicles and back to good day-to-day photo interpretation that the individual on the ground can use to make decisions.

New technology must be sold to management on the strength of its demonstrated ability to solve management problems (money, manpower, schedule, etc.). Sometimes this can be frustrating but the effort to build credibility pays off.

WYOMING

None

More technical guides are needed.

We need computer capability in local offices to process digital data. Without that capability, training will be (and has been) wasted. DSC should concentrate on developing applications and training-- not operational work.

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